INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
*We Protect Hoosiers and Our Environment.*

*Mitchell E. Daniels, Jr.*
**Governor**

*Thomas W. Easterly*
**Commissioner**

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(317) 232-8603
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VIA ELECTRONIC MAIL

August 25, 2010

Larry W. Roark, General Manager
Duke Energy Indiana, Inc.
15400 Villwock Rd.
Edwardsport, IN 47528

Dear Mr. Roark:

Re: NPDES Permit No. IN0002780
Draft Permit
Duke Energy Indiana, Inc. - Edwardsport
Edwardsport, Indiana
Knox County

Your application and supporting documents have been reviewed and processed in accordance with rules adopted under 327 IAC 5. Enclosed is a copy of the draft NPDES Permit.

Pursuant to IC 13-15-5-1, IDEM will publish a general notice in the newspaper with the largest general circulation within the above county. A 40-day comment period is available in order to solicit input from interested parties, including the general public. In addition, IDEM has scheduled a Public Hearing concerning this Draft permit for Wednesday September 29, 2010, at 6:00 p.m. (local time), at the North Knox High School Auditorium. The purpose of the Hearing is to allow public participation in the determination of the terms and conditions of the NPDES permit.

Please review this draft permit and associated documents carefully to become familiar with the proposed terms and conditions. Comments concerning the draft permit should be submitted in accordance with the procedure outlined in the enclosed public notice form. We suggest that you meet with us to discuss major concerns or objections you may have with the draft permit.

Questions concerning this draft permit may be addressed to Richard Hamblin of my staff, at 317/232-8696.

Sincerely,

Stan Rigney, Section Chief
Industrial NPDES Permits Section
Office of Water Quality

Enclosures
cc: Knox County Health Department
U.S. EPA, Region 5
James Saul, Sierra Club
Bowden Quinn, Sierra Club
John Blair

STATE OF INDIANA

DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

AUTHORIZATION TO DISCHARGE UNDER THE

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM

In compliance with the provisions of the Federal Water Pollution Control Act, as amended, (33 U.S.C. 1251 et seq., the "Act"), Title 13 of the Indiana Code, and regulations adopted by the Water Pollution Control Board, the Indiana Department of Environmental Management (IDEM) is issuing this permit to

DUKE ENERGY INDIANA, Inc.

authorizing the discharge from the Edwardsport Legacy Generating Station that is located at 15400 Villwock Road and the Integrated Gasification Combined Cycle Generating Station that is located at 15424 East State Road 358, Edwardsport, Indiana, to receiving waters named the West Fork of the White River in accordance with effluent limitations, monitoring requirements, and other conditions set forth in Parts I, II, III, and IV hereof. This permit may be revoked for the nonpayment of applicable fees in accordance with IC 13-18-20.

Effective Date:_____

Expiration Date:_____

In order to receive authorization to discharge beyond the date of expiration, the permittee shall submit such information and forms as are required by the Indiana Department of Environmental Management no later than 180 days prior to the date of expiration.

Signed on _____ for the Indiana Department of Environmental Management.

_____

Bruno Pigott
Assistant Commissioner
Office of Water Quality

# PART I

## A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

1. During the period beginning on the effective date of this permit and lasting until cessation of operation of the boilers at the Legacy Station[1], the permittee is authorized to discharge from Outfall 001 in accordance with the terms and conditions of this permit. The discharge is limited to once through condenser cooling water, strainer backwash, and intake screen backwash. Samples taken in compliance with the monitoring requirements below shall be taken at a point representative of the discharge but prior to entry into the West Fork of the White River. Such discharge shall be limited and monitored by the permittee as specified below:

DISCHARGE LIMITATIONS[2][3][4]

Table 1

| | Quantity or Loading | | | Quality or Concentration | | | Monitoring Requirements | |
|---|---|---|---|---|---|---|---|---|
| Parameter | Monthly Average | Daily Maximum | Units | Monthly Average | Daily Maximum | Units | Measurement Frequency | Sample Type |
| Flow[5] | Report | Report | MGD | -------- | --------- | ------ | Daily | 24 Hour Total |
| Upstream Flow | Report | Report | MGD | -------- | --------- | ------ | Daily | Gauge |
| Total Residual Chlorine | | | | | | | | |
| Continuous[6] | ------ | -------- | ------ | 0.016 | 0.038 | mg/l | 2 X Weekly | Grab |
| Intermittent[7][8 | ------ | -------- | ------ | -------- | 0.2 | mg/l | 1 X Daily | Grab |
| Total Residual Oxidants[9] | ------- | ------- | ------ | -------- | 0.06 | mg/l | 1 X Daily | Grab |
| Chlorination/ Bromination Frequency[10] | ------ | ------- | ------ | -------- | Report | Time/ Day | 1 X Monthly | Report |
| Time Period per Chlorination/ Bromination Dose (Duration)[10] | ------ | ------ | ------ | -------- | Report | Minute | 1 X Monthly | Report |
| Temperature[12] | | | | | | | | |
| Intake | ------ | ------ | ------ | -------- | Report | °F | Daily | Continuous[11] |
| Effluent | ------ | ------ | ------ | -------- | Report | °F | Daily | Continuous[11] |
| Mixed River Temperature[13] | ------ | ------ | ------ | -------- | Report | °F | Daily | Calculated |

[1] Duke shall notify IDEM by written correspondence to the Compliance Data Section of the Office of Water Quality that operation of the boilers of the Legacy Station has ceased. This notification should include the date of startup of the IGCC and the expected date that discharges from Outfall 001 will cease.

[2] In the event that changes are to be made in the use of water treatment additives including dosage rates contributing to Outfall 001, the permittee shall notify the

Indiana Department of Environmental Management as required in Part II.C.1 of this permit. The use of any new or changed water treatment additives or dosage rates shall not cause the discharge from any permitted outfall to exhibit chronic or acute toxicity. Acute and chronic aquatic toxicity information must be provided with any notification regarding any new or changed water treatment additives or dosage rates.

[3] See Part I.B. of the permit for the Narrative Water Quality Standards.

[4] See Part III. and Part IV of the permit for additional requirements.

[5] The permittee may be allowed to use engineering calculations (pump capacity x hours logged) to measure flow as approved by the commissioner.

[6] The water quality based effluent limit (WQBEL) for chlorine is less than the limit of quantitation (LOQ) as specified below. Compliance with this permit will be demonstrated if the effluent concentrations measured are less than the LOQ.

If the measured concentration of chlorine is greater than the water quality based effluent limitations and above the respective LOD specified in the table below in any three (3) consecutive analyses, or any five (5) out of nine (9) analyses, then the discharger shall:

(1) re-examine the chlorination /dechlorination procedures.

(2) The sampling and analysis for chlorine shall be increased to 5 x Weekly and remain at this increased sampling frequency until:

(a) The increased sampling frequency for chlorine has been in place for at least two weeks;

(b) At least nine (9) samples have been taken under this increased sampling frequency; and

(c) The measured concentration of chlorine is less than the LOD specified in the table above in at least seven (7) out of the nine (9) most recent analysis.

| Parameter | Test Method | LOD | LOQ |
|---|---|---|---|
| Chlorine | 4500-Cl-D,E or 4500-Cl-G | 0.02 mg/l | 0.06 mg/l |

[7] The limit is based on 327 IAC 2-1-6. To qualify for the intermittent discharge limitations of 0.2 mg/l daily maximum TRC, the total exposure for Outfall 001 to TRC shall not exceed forty (40) minutes in duration and such periods shall be separated by at least five (5) hours. Simultaneous multi-unit chlorination is permitted.

[8] The effluent limitations for TRC apply to peak concentrations occurring during periods of chlorination. Therefore, samples for TRC shall be taken at times expected to reflect peak chlorine concentrations based on previous experience. The exposure time is defined to be from the point of first detectable measurement to the point of last detectable measurement.

[9] The monitoring requirements and effluent limitations for Total Residual Oxidants (TRO) will apply at any time bromine or a combination of bromine and chlorine is used and may be in the discharge. Use the test methods for Total Residual Chlorine to determine Total Residual Oxidants. At present, two test methods are considered to be acceptable to IDEM, amperometric (4500-Cl-D,E) and DPD colorimetric method (4500-Cl-G), to determine TRO concentrations at the level of 0.06 mg/l. If another EPA test method is to be used, the method must first be approved by this Department.

If the duration of bromination is greater than two (2) hours per day for the facility, debromination is required on a stoichiometric basis to ensure that all bromine has been reduced to bromide.

[10] The monitoring for "chlorination/bromination frequency" and "time period per chlorination/bromination dose (duration)" applies only when the facility is chlorinating intermittently.

[11] During compliance months of June, July, August, and September, temperature will be monitored continuously and measurements recorded every hour. The facility shall report the highest reading of the day.

During non-compliance months, the facility shall report temperature readings once every eight (8) hours and report the highest reading of the day.

[12] See Part III. A of the permit for temperature limits and requirements.

[13] See Part III. B of the permit for the method to calculate the Mixed River Temperature.

2. During the period beginning on the effective date of this permit and lasting until discharge of wastewaters described in this paragraph from operation and decommissioning of the Legacy Station has ceased[1], the permittee is authorized to discharge from Outfall 002 in accordance with the terms and conditions of this permit. The discharge is limited to the ash pond, low volume waste streams, coal pile runoff, periodic metal cleaning wastes, super-heater drains, and miscellaneous cooling wastestreams. Samples taken in compliance with the monitoring requirements below shall be taken at a point representative of the discharge but prior to entry into the West Fork of the White River. Such discharge shall be limited and monitored by the permittee as specified below:

DISCHARGE LIMITATIONS[2][3]

Table 1

| | Quantity or Loading | | | Quality or Concentration | | | Monitoring Requirements | |
|---|---|---|---|---|---|---|---|---|
| Parameter[4] | Monthly Average | Daily Maximum | Units | Monthly Average | Daily Maximum | Units | Measurement Frequency | Sample Type |
| Flow | Report | Report | MGD | -------- | --------- | ------ | Daily | 24 Hour Total |
| Total Suspended Solids | ------ | -------- | ------ | 30 | 100 | mg/l | 1 X Weekly | Grab |
| Oil and Grease | ------ | -------- | ------ | 15 | 20 | mg/l | 1 X Weekly | Grab |
| Copper[6] | ------ | -------- | ------ | -------- | 0.2 | mg/l | 1 X Daily | 8-Hr Comp |
| Iron[6] | ------ | -------- | ------ | -------- | 1.0 | mg/l | 1 X Daily | 8-Hr Comp |
| Arsenic | ------ | -------- | ------ | Report | Report | mg/l | 2 X Monthly | 8-Hr Comp |
| Cadmium | ------ | -------- | ------ | Report | Report | mg/l | 2 X Monthly | 8-Hr Comp |
| Selenium | ------ | -------- | ------ | Report | Report | mg/l | 2 X Monthly | 8-Hr Comp |
| Nickel | ------ | -------- | ------ | Report | Report | mg/l | 2 X Monthly | 8-Hr Comp |
| Aluminum | ------ | -------- | ------ | Report | Report | mg/l | 2 X Monthly | 8-Hr Comp |
| Silver | ------ | -------- | ------ | Report | Report | mg/l | 2 X Monthly | 8-Hr Comp |
| Zinc | ------ | -------- | ------ | Report | Report | mg/l | 2 X Monthly | 8-Hr Comp |
| Free Cyanide[5] | ------ | -------- | ------ | Report | Report | mg/l | 2 X Monthly | Grab |
| Sulfate | ------ | -------- | ------ | Report | Report | mg/l | 2 X Monthly | 8-Hr Comp |
| Mercury[7] | ------ | -------- | ------ | -------- | Report | ng/l | Bi-Monthly | Grab |

Table 2

| | Quality or Concentration | | | Monitoring Requirements | |
|---|---|---|---|---|---|
| Parameter | Daily Minimum | Daily Maximum | Units | Measurement Frequency | Sample Type |
| pH | 6.0 | 9.0 | s.u. | 1 X Weekly | Grab |

[1] Duke shall notify IDEM by written correspondence to the Compliance Data Section of the Office of Water Quality that the discharge of wastewaters described in this paragraph from the Legacy Station has ceased. This notification should include the date of cessation of discharge of such wastewaters. Residual discharges under this paragraph may overlap commencement of discharge from the IGCC Station under Part I.A.4. of this permit.

[2] In the event that changes are to be made in the use of water treatment additives including dosage rates contributing to Outfall 002, the permittee shall notify the Indiana Department of Environmental Management as required in Part II.C.1 of this permit. The use of any new or changed water treatment additives or dosage rates shall not cause the discharge from any permitted outfall to exhibit chronic or acute toxicity. Acute and chronic aquatic toxicity information must be provided with any notification regarding any new or changed water treatment additives or dosage rates.

[3] See Part I.B. of the permit for the Narrative Water Quality Standards.

[4] The permittee shall measure and report the identified metals as total recoverable metals.

[5] Sample preservation procedures and maximum allowable holding times for available (free) cyanide are prescribed in Table II of 40 CFR Part 136. Note the footnotes specific to cyanide. Preservation and holding time information in Table II takes precedence over information in specific methods or elsewhere.

| Parameter | Test Method | LOD | LOQ |
|---|---|---|---|
| Cyanide | 1677 | 0.5 ug/l | 1.6 ug/l |

[6] These limitations and monitoring requirements apply only during discharge of metal cleaning wastes. The permittee may apply them on a net basis, as defined in Part I.C.3.1. The term metal cleaning wastes means any wastewater (including chemical cleaning liquor, rinse water, and passivation solution) resulting from cleaning (with or without chemical compounds). The volume of boiler cleaning waste to which these limits apply is two (2) boiler volumes, including the initial cleaning solution and the first rinse. For the purpose of this permit, air pre-heater wash, although defined under 40 CFR 423.112(b)(5) as a metal waste, is to be considered as a low volume wastestream.

[7] Mercury monitoring shall be conducted bi-monthly in the months of February, April, June, August, October, and December of each year for the term of the permit using EPA Test Method 1631, Revision E.

After six (6) samples have been completed over the course of the first year of monitoring, the permittee may submit a request for review of all mercury monitoring data for the consideration of a reduction of mercury monitoring. Bi-monthly (6 X Yearly) monitoring shall continue until a permit modification is approved.

3. During the period beginning on the effective date of this permit and lasting until cessation of operation of the boilers at the Legacy Station[1], the permittee is authorized to discharge from Internal Outfall 101 in accordance with the terms and conditions of this permit. The discharge is limited to boiler blowdown. Samples taken in compliance with the monitoring requirements below shall be taken at a point representative of the discharge but prior to mixing with other wastestreams, except pH, with may be taken after commingled with cooling water. Such discharge shall be limited and monitored by the permittee as specified below:

DISCHARGE LIMITATIONS[1]

Table 1

| | Quantity or Loading | | | Quality or Concentration | | | Monitoring Requirements | |
|---|---|---|---|---|---|---|---|---|
| Parameter | Monthly Average | Daily Maximum | Units | Monthly Average | Daily Maximum | Units | Measurement Frequency | Sample Type |
| Flow | Report | Report | MGD | -------- | --------- | ------ | 1 X Quarterly | 24 Hour Total |
| Total Suspended Solids | ------ | -------- | ------ | 30 | 100 | mg/l | 1 X Quarterly | Grab |
| Oil and Grease | ------ | -------- | ------ | 15 | 20 | mg/l | 1 X Quarterly | Grab |

Table 2

| | Quality or Concentration | | | Monitoring Requirements | |
|---|---|---|---|---|---|
| Parameter | Daily Minimum | Daily Maximum | Units | Measurement Frequency | Sample Type |
| pH | 6.0 | 9.0 | s.u. | 1 X Quarterly | Grab |

[1] Samples shall be taken once at any time during each of the four annual quarters:

(A) January-February-March;
(B) April-May-June;
(C) July-August-September; and
(D) October-November-December.

For quarterly monitoring, in the first quarter for example, the permittee may conduct sampling within the month of January, February or March. The result from this reporting timeframe shall be reported on the March DMR, regardless of which of the months within the quarter the sample was taken.

4. During the period beginning immediately upon commencement of discharge of any of the wastewaters described in this paragraph from the IGCC facility[1], the permittee is authorized to discharge from Outfall 002 in accordance with the discharge limitations contained in this paragraph and all other applicable terms and conditions of this permit. The discharge is limited to coal pile runoff, coal pile runoff pond effluent, site storm water, treated sanitary effluent, oil/water separator water, cooling tower blowdown, gasification and power block quenches and drains, softener regenerant, filter regenerant, 'grey-water' treatment flow, and other wastewater treatment flows. Samples taken in compliance with the monitoring requirements below shall be taken at a point representative of the discharge but prior to entry into the West Fork of the White River. Such discharge shall be limited and monitored by the permittee as specified below:

DISCHARGE LIMITATIONS[2][3]

Table 1

| | Quantity or Loading | | | Quality or Concentration | | | Monitoring Requirements | |
|---|---|---|---|---|---|---|---|---|
| Parameter[4] | Monthly Average | Daily Maximum | Units | Monthly Average | Daily Maximum | Units | Measurement Frequency | Sample Type |
| Flow | Report | Report | MGD | -------- | --------- | ------ | Daily | 24 Hr Total |
| Total Suspended Solids | ------ | -------- | ------ | 30 | 100 | mg/l | 2 X Weekly | Grab |
| Oil & Grease | ------ | -------- | ------ | 15 | 20 | mg/l | 2 X Weekly | Grab |
| Temperature[5] | ------ | -------- | ------ | Report | Report | °F | 1 X Weekly | Grab |
| Total Residual Chlorine [6] | ------ | -------- | ------ | 0.02 | 0.04 | mg/l | 2 X Weekly | Grab |
| Copper | ------ | -------- | ------ | 0.042 | 0.084 | mg/l | 2 X Weekly | 24-Hr Comp |
| Iron | ------ | -------- | ------ | 1.0 | 1.0 | mg/l | 2 X Weekly | 24-Hr Comp |
| Arsenic[8] | ------ | -------- | ------ | Report | Report | mg/l | 1 X Weekly | 24-Hr Comp |
| Cadmium | ------ | -------- | ------ | 0.011 | 0.022 | mg/l | 1 X Weekly | 24-Hr Comp |
| Selenium | ------ | -------- | ------ | 0.13 | 0.26 | mg/l | 1 X Weekly | 24-Hr Comp |
| Nickel[8] | ------ | -------- | ------ | Report | Report | mg/l | 1 X Weekly | 24-Hr Comp |
| Aluminum[8] | ------ | -------- | ------ | Report | Report | mg/l | 1 X Weekly | 24-Hr Comp |
| Beryllium[8] | ------ | -------- | ------ | Report | Report | mg/l | 1 X Weekly | 24-Hr Comp |
| Silver[8] | ------ | -------- | ------ | Report | Report | mg/l | 1 X Weekly | 24-Hr Comp |
| Zinc | ------ | -------- | ------ | 0.25 | 0.51 | mg/l | 2 X Weekly | 24-Hr Comp |
| Free Cyanide[7][8] | ------ | -------- | ------ | Report | Report | mg/l | 1 X Weekly | Grab |
| Total Cyanide[7][8] | ------ | -------- | ------ | Report | Report | mg/l | 1 X Weekly | Grab |
| Sulfate (as SO4)[8] | ------ | -------- | ------ | Report | Report | mg/l | 1 X Weekly | 24-Hr Comp |
| Sulfide (as S)[8] | ------ | -------- | ------ | Report | Report | mg/l | 1 X Weekly | Grab |
| Mercury[9] | ------ | -------- | ------ | 12 | 20 | ng/l | Bi-Monthly | Grab |
| Chloride[8] | ------ | -------- | ------ | Report | Report | mg/l | 1 X Weekly | 24-Hr Comp |
| Lead[8] | ------ | -------- | ------ | Report | Report | mg/l | 1 X Weekly | 24-Hr Comp |
| Total Chromium | ------ | -------- | ------ | 0.2 | 0.2 | mg/l | 2 X Weekly | 24-Hr Comp |
| Thallium[8] | ------ | -------- | ------ | Report | Report | mg/l | 1 X Weekly | 24-Hr Comp |
| Ammonia(as N) | ------ | -------- | ------ | 12 | 24 | mg/l | 1 X Weekly | 24-Hr Comp |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Fluoride[8] | ------ | -------- | ------ | Report | Report | mg/l | 1 X Weekly | 24-Hr Comp |
| Antimony[8] | ------ | -------- | ------ | Report | Report | mg/l | 1 X Weekly | 24-Hr Comp |
| Barium[8] | ------ | -------- | ------ | Report | Report | mg/l | 1 X Weekly | 24-Hr Comp |
| Manganese[8] | ------ | -------- | ------ | Report | Report | mg/l | 1 X Weekly | 24-Hr Comp |
| Phenol[8] | ------ | -------- | ------ | Report | Report | mg/l | 1 X Weekly | Grab |
| Whole Effluent Toxicity Testing[10] | | | | | | | | |

Table 2

| | Quality or Concentration | | | Monitoring Requirements | |
|---|---|---|---|---|---|
| | Daily | Daily | | Measurement | Sample |
| Parameter | Minimum | Maximum | Units | Frequency | Type |
| pH | 6.0 | 9.0 | s.u. | 2 X Weekly | Grab |

[1] Duke shall notify IDEM by written correspondence to the Compliance Data Section of the Office of Water Quality that commencement of discharge of any of the wastewaters described in this paragraph from the IGCC Station has occurred. The notification required by this footnote does not apply to the discharge of construction-related storm water, which is authorized independently of this permit condition. This notification should include the date that such discharges from Outfall 002 has commenced.

[2] In the event that changes are to be made in the use of water treatment additives including dosage rates contributing to Outfall 002, the permittee shall notify the Indiana Department of Environmental Management as required in Part II.C.1 of this permit. The use of any new or changed water treatment additives or dosage rates shall not cause the discharge from any permitted outfall to exhibit chronic or acute toxicity. Acute and chronic aquatic toxicity information must be provided with any notification regarding any new or changed water treatment additives or dosage rates.

[3] See Part I.B. of the permit for the Narrative Water Quality Standards.

[4] The permittee shall measure and report the identified metals as <u>total recoverable metals.</u>

[5] The discharge from Outfall 002 shall not cause the receiving waters, after mixing with the discharge, to exceed the following conditions:

(1) There shall be no abnormal temperature changes that may adversely affect aquatic life unless caused by natural conditions.

(2) The normal daily and seasonal temperature fluctuations that existed before the addition of heat due to other than natural causes shall be maintained.

(3) The maximum temperature rise at any time or place above natural shall not exceed five (5) degrees Fahrenheit (two and eight-tenths (2.8) degrees Celsius) in streams.

[6] The water quality based effluent limit (WQBEL) for chlorine is less than the limit of quantitation (LOQ) as specified below. Compliance with this permit will be demonstrated if the effluent concentrations measured are less than the LOQ.

If the measured concentration of chlorine is greater than the water quality based effluent limitations and above the respective LOD specified in the table below in any three (3) consecutive analyses, or any five (5) out of nine (9) analyses, then the discharger shall:

(1) Determine the source of the parameter through an evaluation of sampling techniques, analytical/laboratory procedures, and waste streams (including internal waste streams); and re-examine the chlorination /dechlorination procedures.

(2) The sampling and analysis for chlorine shall be increased to 5X weekly and remain at this increased sampling frequency until:

(a) The increased sampling frequency for chlorine has been in place for at least two weeks;

(b) At least nine (9) samples have been taken under this increased sampling frequency; and

(c) The measured concentration of chlorine is less than the LOD specified in the table above in at least seven (7) out of the nine (9) most recent analysis.

| Parameter | Test Method | LOD | LOQ |
|---|---|---|---|
| Chlorine | 4500-Cl-D,E or 4500-Cl-G | 0.02 mg/l | 0.06 mg/l |

[7] Sample preservation procedures and maximum allowable holding times for total cyanide, or available (free) cyanide are prescribed in Table II of 40 CFR Part 136. Note the footnotes specific to cyanide. Preservation and holding time information in Table II takes precedence over information in specific methods or elsewhere.

| Parameter | Test Method | LOD | LOQ |
|---|---|---|---|
| Free Cyanide | 1677 | 0.5 ug/l | 1.6 ug/l |
| Total Cyanide | 335.2 or 4500 CN-E | 5 ug/l | 16 ug/l |

[8] The above noted parameter(s) shall be monitored to determine whether or not it is present in quantities that have the reasonable potential to exceed the calculated water quality based effluent limits. At the end of a twelve month sampling period, the permittee may request, in writing, a review of these requirements. Upon review by IDEM, the permit may be modified, after public notice and opportunity for hearing, to delete the monitoring requirements or to include appropriate effluent limitations.

[9] Mercury monitoring shall be conducted bi-monthly in the months of February, April, June, August, October, and December of each year for the term of the permit using EPA Test Method 1631, Revision E.

After six (6) samples have been completed over the course of the first year of monitoring, the permittee may submit a request for review of all mercury monitoring data for the consideration of a reduction of mercury monitoring. Bi-monthly (6 X Yearly) monitoring shall continue until a permit modification is approved.

The following EPA test methods and/or Standard Methods and associated LODs and LOQs are to be used in the analysis of the effluent samples. Alternative methods may be used if first approved by IDEM.

| Parameter | EPA Method | LOD | LOQ |
|---|---|---|---|
| Mercury | 1631, Revision E | 0.2 ng/l | 0.5 ng/l |

[10] The permittee shall initiate a biomonitoring program for Outfall 002 using the procedures contained under Part I.F. of this permit.

5. During the period beginning immediately after start-up of the IGCC facility[1], the permittee is authorized to discharge from Internal Outfall 201 in accordance with the terms and conditions of this permit. The discharge is limited to treated sanitary effluent. Samples taken in compliance with the monitoring requirements below shall be taken at a point representative of the discharge but prior to co-mingling with other wastestreams. Such discharge shall be limited and monitored by the permittee as specified below:

## DISCHARGE LIMITATIONS

Table 1

| | Quantity or Loading | | | Quality or Concentration | | | Monitoring | Requirements |
|---|---|---|---|---|---|---|---|---|
| | Monthly | Daily | | Monthly | Daily | | Measurement | Sample |
| Parameter | Average | Maximum | Units | Average | Maximum | Units | Frequency | Type |
| Flow | Report | Report | MGD | -------- | --------- | ------ | 2 X Weekly | 24 Hr Total |
| Total Suspended Solids | ------ | -------- | ------ | -------- | 30 | mg/l | 2 X Weekly | Grab |
| $CBOD_5$ | ------ | -------- | ------ | -------- | 25 | mg/l | 2 X Weekly | Grab |

[1] Duke shall provide IDEM by written correspondence to the Compliance Data Section of the Office of Water Quality, notification that the startup of the IGCC has occurred. This notification should include the date of startup of the IGCC and the expected date that discharges from Outfall 201 will be occurring.

6. The permittee is authorized to discharge storm water from Outfalls 003, 004, and 005 in accordance with the terms and conditions of this permit. Samples taken in compliance with the monitoring requirements below shall be taken at a point representative of the discharge but prior to entry into the West Fork of the White River. Such discharge shall be limited and monitored by the permittee as specified below:

DISCHARGE LIMITATIONS[1][2]

| | | | Monitoring Requirements | |
|---|---|---|---|---|
| Parameter | Daily Maximum | Units | Measurement Frequency | Sample Type |
| Flow | Report | MGD | 1 X Quarterly | Estimate Total |
| Total Suspended Solids | Report | mg/l | 1 X Quarterly | Grab |
| pH | Report | s.u. | 1 X Quarterly | Grab |
| Oil & Grease | Report | mg/l | 1 X Quarterly | Grab |
| COD | Report | mg/l | 1 X Quarterly | Grab |
| $CBOD_5$ | Report | mg/l | 1 X Quarterly | Grab |
| Total Kjeldahl Nitrogen | Report | mg/l | 1 X Quarterly | Grab |
| Nitrate plus Nitrite Nitrogen | Report | mg/l | 1 X Quarterly | Grab |
| Total Phosphorus | Report | mg/l | 1 X Quarterly | Grab |

[1] All samples shall be collected from the discharge resulting from a storm event that is greater than 0.1 inches and at least 72 hours from the previously measurable (greater than 0.1 inch rainfall) storm event.

For each sample taken, the permittee shall record the duration and total rainfall of the storm event, the number of hours between beginning of the storm measured and the end of the previous measurable rain event, and the outside temperature at the time of sampling.

A grab sample shall be taken during the first thirty (30) minutes of the discharge (or as soon thereafter as practicable).

[2] The Storm Water Monitoring and Non Numeric Effluent Limits and the Storm Water Pollution Prevention Plan (SWP3) requirements can be found in Part I.D. and I.E of this permit

7. During the period beginning immediately after start-up of the IGCC facility, the permittee is required to monitor influent to the Off Spec Pond, deemed Internal Outfall 301, in accordance with the terms and conditions of this permit. The discharge is comprised of process upset wastestreams and storm water entering the Off Spec Pond. Samples taken in compliance with the monitoring requirements below shall be taken at a point representative of the total influent at time of usage. Such wastestream shall be monitored by the permittee as specified below:

## DISCHARGE LIMITATIONS[1]

Table 1

| | Quantity or Loading | | | Quality or Concentration | | | Monitoring Requirements | |
|---|---|---|---|---|---|---|---|---|
| | Monthly | Daily | | Monthly | Daily | | Measurement | Sample |
| Parameter[2] | Average | Maximum | Units | Average | Maximum | Units | Frequency | Type |
| Flow | Report | Report | MGD | ------ | -------- | ------ | Daily | Estimate Total |
| Total Suspended Solids | ------ | -------- | ------ | Report | Report | mg/l | Daily | Grab |
| Oil & Grease | ------ | -------- | ------ | Report | Report | mg/l | Daily | Grab |
| Total Residual Chlorine | ------ | -------- | ------ | Report | Report | mg/l | Daily | Grab |
| Copper | ------ | -------- | ------ | Report | Report | mg/l | Daily | 24-hour composite |
| Iron | ------ | -------- | ------ | Report | Report | mg/l | Daily | 24-hour composite |
| Arsenic | ------ | -------- | ------ | Report | Report | mg/l | Daily | 24-hour composite |
| Cadmium | ------ | -------- | ------ | Report | Report | mg/l | Daily | 24-hour composite |
| Selenium | ------ | -------- | ------ | Report | Report | mg/l | Daily | 24-hour composite |
| Nickel | ------ | -------- | ------ | Report | Report | mg/l | Daily | 24-hour composite |
| Aluminum | ------ | -------- | ------ | Report | Report | mg/l | Daily | 24-hour composite |
| Beryllium | ------ | -------- | ------ | Report | Report | mg/l | Daily | 24-hour composite |
| Silver | ------ | -------- | ------ | Report | Report | mg/l | Daily | 24-hour composite |
| Zinc | ------ | -------- | ------ | Report | Report | mg/l | Daily | 24-hour composite |
| Free Cyanide[3] | ------ | -------- | ------ | Report | Report | mg/l | Daily | Grab |
| Total Cyanide[3] | ------ | -------- | ------ | Report | Report | mg/l | Daily | Grab |
| Sulfate (as SO4) | ------ | -------- | ------ | Report | Report | mg/l | Daily | 24-hour composite |
| Sulfide (as S) | ------ | -------- | ------ | Report | Report | mg/l | Daily | Grab |
| Mercury[4] | ------ | -------- | ------ | Report | Report | ng/l | Daily | Grab |
| Chloride | ------ | -------- | ------ | Report | Report | mg/l | Daily | 24-hour composite |
| Lead | ------ | -------- | ------ | Report | Report | mg/l | Daily | 24-hour composite |
| Total Chromium | ------ | -------- | ------ | Report | Report | mg/l | Daily | 24-hour composite |
| Thallium | ------ | -------- | ------ | Report | Report | mg/l | Daily | 24-hour composite |
| Ammonia (as N) | ------ | -------- | ------ | Report | Report | mg/l | Daily | 24-hour composite |
| Fluoride | ------ | -------- | ------ | Report | Report | mg/l | Daily | 24-hour composite |
| Antimony | ------ | -------- | ------ | Report | Report | mg/l | Daily | 24-hour composite |
| Barium | ------ | -------- | ------ | Report | Report | mg/l | Daily | 24-hour composite |
| Manganese | ------ | -------- | ------ | Report | Report | mg/l | Daily | 24-hour composite |
| Phenol | ------ | -------- | ------ | Report | Report | mg/l | Daily | Grab |

Table 2

| | Quality or Concentration | | | Monitoring | Requirements |
|---|---|---|---|---|---|
| | Daily | Daily | | Measurement | Sample |
| Parameter | Minimum | Maximum | Units | Frequency | Type |
| pH | Report | Report | s.u. | Daily | Grab |

[1] At the end of a six month sampling period, the permittee may request, in writing, a review of the above requirements. Upon review by IDEM, the permit may be modified, after public notice and opportunity for hearing, to delete the monitoring requirements or to include appropriate effluent limitations.

[2] The permittee shall measure and report the identified metals as total recoverable metals.

[3] Sample preservation procedures and maximum allowable holding times for total cyanide, or available (free) cyanide are prescribed in Table II of 40 CFR Part 136. Note the footnotes specific to cyanide. Preservation and holding time information in Table II takes precedence over information in specific methods or elsewhere.

| Parameter | Test Method | LOD | LOQ |
|---|---|---|---|
| Free Cyanide | 1677 | 0.5 ug/l | 1.6 ug/l |
| Total Cyanide | 335.2 or 4500 CN-E | 5 ug/l | 16 ug/l |

[4] The following EPA test methods and/or Standard Methods and associated LODs and LOQs are to be used in the analysis of the effluent samples. Alternative methods may be used if first approved by IDEM.

| Parameter | EPA Method | LOD | LOQ |
|---|---|---|---|
| Mercury | 1631, Revision E | 0.2 ng/l | 0.5 ng/l |

8. During the period beginning immediately after start-up of the IGCC facility, the permittee is authorized to discharge from Internal Outfall 401 in accordance with the terms and conditions of this permit. The discharge is comprised of emergency overflow from the Southeast Pond. Samples taken in compliance with the monitoring requirements below shall be taken at a point representative of the discharge but prior to co-mingling with other wastestreams. Such discharge shall be limited and monitored by the permittee as specified below:

DISCHARGE LIMITATIONS

Table 1

| | Quantity or Loading | | | Quality or Concentration | | | Monitoring | Requirements |
|---|---|---|---|---|---|---|---|---|
| | Monthly | Daily | | Monthly | Daily | | Measurement | Sample |
| Parameter | Average | Maximum | Units | Average | Maximum | Units | Frequency | Type |
| Flow | Report | Report | MGD | --------- | ---------- | ------ | Daily | Estimate Total |
| Whole Effluent Toxicity Testing[1] | | | | | | | Daily | Report |

[1] The permittee shall initiate a biomonitoring program for Internal Outfall 401 using the procedures contained under Part I.F. of this permit except in relation to sample frequency. For this internal outfall, Whole Effluent Toxicity Testing shall be performed any day there is a discharge from the Emergency Overflow of the Southeast Pond.

9. During the period beginning immediately after start-up of the IGCC facility, the permittee is authorized to discharge from Internal Outfall 501 in accordance with the terms and conditions of this permit. The discharge is comprised of the 'grey-water' treatment system effluent. Samples taken in compliance with the monitoring requirements below shall be taken at a point representative of the discharge but prior to co-mingling with other wastestreams. Such discharge shall be limited and monitored by the permittee as specified below:

## DISCHARGE LIMITATIONS[1]

Table 1

| | Quantity or Loading | | | Quality or Concentration | | | Monitoring | Requirements |
|---|---|---|---|---|---|---|---|---|
| | Monthly | Daily | | Monthly | Daily | | Measurement | Sample |
| Parameter[2] | Average | Maximum | Units | Average | Maximum | Units | Frequency | Type |
| Flow | Report | Report | MGD | ------ | -------- | ------ | 2 X Monthly | Estimate Total |
| Total Suspended Solids | ------ | -------- | ------ | Report | Report | mg/l | 2 X Monthly | Grab |
| Oil & Grease | ------ | -------- | ------ | Report | Report | mg/l | 2 X Monthly | Grab |
| Copper | ------ | -------- | ------ | Report | Report | mg/l | 2 X Monthly | 24-hour composite |
| Iron | ------ | -------- | ------ | Report | Report | mg/l | 2 X Monthly | 24-hour composite |
| Arsenic | ------ | -------- | ------ | Report | Report | mg/l | 2 X Monthly | 24-hour composite |
| Cadmium | ------ | -------- | ------ | Report | Report | mg/l | 2 X Monthly | 24-hour composite |
| Selenium | ------ | -------- | ------ | Report | Report | mg/l | 2 X Monthly | 24-hour composite |
| Nickel | ------ | -------- | ------ | Report | Report | mg/l | 2 X Monthly | 24-hour composite |
| Aluminum | ------ | -------- | ------ | Report | Report | mg/l | 2 X Monthly | 24-hour composite |
| Beryllium | ------ | -------- | ------ | Report | Report | mg/l | 2 X Monthly | 24-hour composite |
| Silver | ------ | -------- | ------ | Report | Report | mg/l | 2 X Monthly | 24-hour composite |
| Zinc | ------ | -------- | ------ | Report | Report | mg/l | 2 X Monthly | 24-hour composite |
| Free Cyanide[3] | ------ | -------- | ------ | Report | Report | mg/l | 2 X Monthly | Grab |
| Total Cyanide[3] | ------ | -------- | ------ | Report | Report | mg/l | 2 X Monthly | Grab |
| Sulfate (as SO4) | ------ | -------- | ------ | Report | Report | mg/l | 2 X Monthly | 24-hour composite |
| Sulfide (as S) | ------ | -------- | ------ | Report | Report | mg/l | 2 X Monthly | Grab |
| Mercury[4] | ------ | -------- | ------ | Report | Report | ng/l | 2 X Monthly | Grab |
| Chloride | ------ | -------- | ------ | Report | Report | mg/l | 2 X Monthly | 24-hour composite |
| Lead | ------ | -------- | ------ | Report | Report | mg/l | 2 X Monthly | 24-hour composite |
| Total Chromium | ------ | -------- | ------ | Report | Report | mg/l | 2 X Monthly | 24-hour composite |
| Thallium | ------ | -------- | ------ | Report | Report | mg/l | 2 X Monthly | 24-hour composite |
| Ammonia (as N) | ------ | -------- | ------ | Report | Report | mg/l | 2 X Monthly | 24-hour composite |
| Fluoride | ------ | -------- | ------ | Report | Report | mg/l | 2 X Monthly | 24-hour composite |
| Antimony | ------ | -------- | ------ | Report | Report | mg/l | 2 X Monthly | 24-hour composite |
| Barium | ------ | -------- | ------ | Report | Report | mg/l | 2 X Monthly | 24-hour composite |
| Manganese | ------ | -------- | ------ | Report | Report | mg/l | 2 X Monthly | 24-hour composite |
| Phenol | ------ | -------- | ------ | Report | Report | mg/l | 2 X Monthly | Grab |

Table 2

| | Quality or Concentration | | | Monitoring | Requirements |
|---|---|---|---|---|---|
| | Daily | Daily | | Measurement | Sample |
| Parameter | Minimum | Maximum | Units | Frequency | Type |
| pH | Report | Report | s.u. | 2 X Monthly | Grab |

[1] The permittee is required to collect twice monthly samples from the grey water treatment system for a six month period. After such period, monitoring of this Internal Outfall will cease.

[2] The permittee shall measure and report the identified metals as total recoverable metals.

[3] Sample preservation procedures and maximum allowable holding times for total cyanide, or available (free) cyanide are prescribed in Table II of 40 CFR Part 136. Note the footnotes specific to cyanide. Preservation and holding time information in Table II takes precedence over information in specific methods or elsewhere.

| Parameter | Test Method | LOD | LOQ |
|---|---|---|---|
| Free Cyanide | 1677 | 0.5 ug/l | 1.6 ug/l |
| Total Cyanide | 335.2 or 4500 CN-E | 5 ug/l | 16 ug/l |

[4] The following EPA test methods and/or Standard Methods and associated LODs and LOQs are to be used in the analysis of the effluent samples. Alternative methods may be used if first approved by IDEM.

| Parameter | EPA Method | LOD | LOQ |
|---|---|---|---|
| Mercury | 1631, Revision E | 0.2 ng/l | 0.5 ng/l |

B. NARRATIVE WATER QUALITY STANDARDS

At all times the discharge from any and all point sources specified within this permit shall not cause receiving waters:

1. including the mixing zone, to contain substances, materials, floating debris, oil, scum, or other pollutants:

   a. that will settle to form putrescent or otherwise objectionable deposits;

   b. that are in amounts sufficient to be unsightly or deleterious;

   c. that produce color, visible oil sheen, odor, or other conditions in such degree as to create a nuisance;

   d. which are in amounts sufficient to be acutely toxic to , or to otherwise severely injure or kill aquatic life, other animals, plants, or humans;

   e. which are in concentrations or combinations that will cause or contribute to the growth of aquatic plants or algae to such a degree as to create a nuisance, be unsightly, or otherwise impair the designated uses.

2. outside the mixing zone, to contain substances in concentrations which on the basis of available scientific data are believed to be sufficient to injure, be chronically toxic to, or be carcinogenic, mutagenic, or teratogenic to humans, animals, aquatic life, or plants.

C. MONITORING AND REPORTING

1. Representative Sampling

   Samples and measurements taken as required herein shall be representative of the volume and nature of the monitored discharge flow and shall be taken at times which reflect the full range and concentration of effluent parameters normally expected to be present. Samples shall not be taken at times to avoid showing elevated levels of any parameters.

2. Monthly Reporting

   The permittee shall submit monitoring reports to the Indiana Department of Environmental Management containing results obtained during the previous month and shall be postmarked no later than the 28th day of the month following each completed monitoring period. The first report shall

be submitted by the 28th day of the month following the month in which the permit becomes effective. These reports shall include, but not necessarily be limited to, the Discharge Monitoring Report (DMR) and the Monthly Monitoring Report (MMR). All reports shall be mailed to IDEM, Office of Water Quality – Mail Code 65-42, Data & Information Services Section, 100 North Senate Ave., Indianapolis, Indiana 46204-2251. The Regional Administrator may request the permittee to submit monitoring reports to the Environmental Protection Agency if it is deemed necessary to assure compliance with the permit.

a. Calculations that require averaging of measurements of daily values (both concentrations and mass) shall use an arithmetic mean, except the monthly average for E. Coli shall be calculated as a geometric mean.

b. Daily effluent values (both mass and concentration) that are less than the LOQ that are used to determine the monthly average effluent level shall be accommodated in calculation of the average using statistical methods that have been approved by the Commissioner.

c. Effluent concentrations less than the LOD shall be reported on the Discharge Monitoring Report (DMR) forms as < (less than) the value of the LOD. For example, if a substance is not detected at a concentration of 0.1 µg/l, report the value as <0.1 µg/l.

d. Effluent concentrations greater than or equal to the LOD and less than the LOQ that are reported on a DMR shall be reported as the actual value and annotated on the DMR to indicate that the value is not quantifiable.

e. Mass discharge values which are calculated from concentrations reported as less than the value of the limit of detection shall be reported as less than the corresponding mass discharge value.

f. Mass discharge values that are calculated from effluent concentrations greater than the limit of detection shall be reported as the calculated value.

3. Definitions

a. "Monthly Average" means the total mass or flow-weighted concentration of all daily discharges during a calendar month on which daily discharges are sampled or measured, divided by the number of daily discharges sampled and/or measured during such calendar month.

The monthly average discharge limitation is the highest allowable average monthly discharge for any calendar month.

b. "Daily Discharge" means the total mass of a pollutant discharged during the calendar day or, in the case of a pollutant limited in terms other than mass pursuant to 327 IAC 5-2-11(e), the average concentration or other measurement of the pollutant specified over the calendar day or any twenty-four hour period that reasonably represents the calendar day for the purposes of sampling.

c. "Daily Maximum" means the maximum allowable daily discharge for any calendar day.

d. A "24-hour composite sample" and/or "8-hour composite sample" means a sample consisting of at least 3 individual flow-proportioned samples of wastewater, taken by the grab sample method or by an automatic sampler, which are taken at approximately equally spaced time intervals for the duration of the discharge within a 24-hour period and/or 8-hour period, respectively, and which are combined prior to analysis. A flow-proportioned composite sample may be obtained by:

(1) recording the discharge flow rate at the time each individual sample is taken,

(2) adding together the discharge flow rates recorded from each individuals sampling time to formulate the "total flow" value,

(3) the discharge flow rate of each individual sampling time is divided by the total flow value to determine its percentage of the total flow value,

(4) then multiply the volume of the total composite sample by each individual sample's percentage to determine the volume of that individual sample which will be included in the total composite sample.

e. "Concentration" means the weight of any given material present in a unit volume of liquid. Unless otherwise indicated in this permit, concentration values shall be expressed in milligrams per liter (mg/l).

f. The "Regional Administrator" is defined as the Region V Administrator, U.S. EPA, located at 77 West Jackson Boulevard, Chicago, Illinois 60604.

g. The "Commissioner" is defined as the Commissioner of the Indiana Department of Environmental Management, which is located at the following address: 100 North Senate Avenue, Indianapolis, Indiana 46204.

h. "Limit of Detection" or "LOD" means the minimum concentration of a substance that can be measured and reported with ninety-nine percent (99%) confidence that the analyte concentration is greater than zero (0) for a particular analytical method and sample matrix.

i. "Limit of Quantitation" or "LOQ" means a measurement of the concentration of a contaminant obtained by using a specified laboratory procedure calibrated at a specified concentration above the method detection level. It is considered the lowest concentration at which a particular contaminant can be quantitatively measured using a specified laboratory procedure for monitoring of the contaminant. This term is also sometimes called limit of quantification or quantification level.

j. "Method Detection Level" or "MDL" means the minimum concentration of an analyte (substance) that can be measured and reported with a ninety-nine percent (99%) confidence that the analyte concentration is greater than zero (0) as determined by procedure set forth in 40 CFR 136, Appendix B. The method detection level or MDL is equivalent to the LOD.

k. "Grab Sample" means a sample which is taken from a wastestream on a one-time basis without consideration of the flow rate of the wastestream and without considerations of time.

l. "Net Limitation" are to be calculated by subtraction from the actual measured concentration of the parameter when limitations apply. These background levels are to be calculated by monitoring the ash pond effluent concentration of Iron and Copper over a period of time, to consist of a minimum of ten samples taken over a minimum of thirty (30) days when there is no discharge of metal cleaning wastes in the quarter preceding such a discharge. The background levels demonstrated by this monitoring, along with supporting data are to be submitted with monthly DMRs when reporting discharge of chemical metal cleaning wastes. A new data base shall be established in the quarter preceding each subsequent discharge of metal cleaning wastes.

4. Test Procedures

The analytical and sampling methods used shall conform to the current version of 40 CFR 136. Multiple editions of Standard Methods for the

Examination of Water and Wastewater are currently approved for most methods, however, 40 CFR Part 136 should be checked to ascertain if a particular method is approved for a particular analyte. The approved methods may be included in the texts listed below. However, different but equivalent methods are allowable if they receive the prior written approval of the Commissioner and the U.S. Environmental Protection Agency.

a. Standard Methods for the Examination of Water and Wastewater 18th, 19th, or 20th Editions, 1992, 1995, or 1998, American Public Health Association, Washington, D.C. 20005.

b. A.S.T.M. Standards, Parts 23, Water; Atmosphere Analysis 1972 American Society for Testing and Materials, Philadelphia, PA 19103.

c. Methods for Chemical Analysis of Water and Wastes June 1974, Revised, March 1983, Environmental Protection Agency, Water Quality Office, Analytical Quality Control Laboratory, 1014 Broadway, Cincinnati, OH 45202.

5. Recording of Results

For each measurement or sample taken pursuant to the requirements of this permit, the permittee shall record and maintain records of all monitoring information and monitoring activities under this permit, including the following information:

a. The exact place, date, and time of sampling;

b. The person(s) who performed the sampling or measurements;

c. The dates the analyses were performed;

d The person(s) who performed the analyses;

e. The analytical techniques or methods used; and

f. The results of all required analyses and measurements.

6. Additional Monitoring by Permittee

If the permittee monitors any pollutant at the location(s) designated herein more frequently than required by this permit, using approved analytical methods as specified above, the results of this monitoring shall be included in the calculation and reporting of the values required in the monthly Discharge Monitoring Report (DMR). Such increased frequency shall also be indicated. Other monitoring data not specifically required in

this permit (such as internal process or internal waste stream data) which is collected by or for the permittee need not be submitted unless requested by the Commissioner.

7. Records Retention

All records and information resulting from the monitoring activities required by this permit, including all records of analyses performed and calibration and maintenance of instrumentation and recording from continuous monitoring instrumentation, shall be retained for a minimum of three (3) years. In cases where the original records are kept at another location, a copy of all such records shall be kept at the permitted facility. The three years shall be extended:

a. automatically during the course of any unresolved litigation regarding the discharge of pollutants by the permittee or regarding promulgated effluent guidelines applicable to the permittee; or

b. as requested by the Regional Administrator or the Indiana Department of Environmental Management.

D. STORM WATER MONITORING AND NON-NUMERIC EFFLUENT LIMITS

Beginning on the effective date of the permit, the permittee shall conduct storm water monitoring for the storm water discharge points listed in Part I.A.6 of the permit to be conducted on quarterly basis.

1. Control Measures and Effluent Limits

In the technology-based limits included in Part D.2-4., the term "minimize" means reduce and/or eliminate to the extent achievable using control measures (including best management practices) that are technologically available and economically practicable and achievable in light of best industry practice.

2. Control Measures

Select, design, install, and implement control measures (including best management practices) to address the selection and design considerations in Part D.3 to meet the non-numeric effluent limits in Part D.4. The selection, design, installation, and implementation of these control measures must be in accordance with good engineering practices and manufacturer's specifications. Any deviation from the manufacturer's specifications shall be documented. If the control measures are not achieving their intended effect in minimizing pollutant discharges, the control measures must be modified as expeditiously as practicable. Regulated stormwater discharges from the facility include

stormwater run-on that commingles with stormwater discharges associated with industrial activity at the facility.

3. Control Measure Selection and Design Considerations

When selecting and designing control measures consider the following:

a. preventing stormwater from coming into contact with polluting materials is generally more effective, and cost-effective, than trying to remove pollutants from stormwater;

b. use of control measures in combination is more effective than use of control measures in isolation for minimizing pollutants in stormwater discharge;

c. assessing the type and quantity of pollutants, including their potential to impact receiving water quality, is critical to designing effective control measures that will achieve the limits in this permit;

d. minimizing impervious areas at your facility and infiltrating runoff onsite (including bioretention cells, green roofs, and pervious pavement, among other approaches) can reduce runoff and improve groundwater recharge and stream base flows in local streams, although care must be taken to avoid ground water contamination;

e. flow can be attenuated by use of open vegetated swales and natural depressions;

f. conservation and/or restoration of riparian buffers will help protect streams from stormwater runoff and improve water quality; and

g. use of treatment interceptors (e.g., swirl separators and sand filters) may be appropriate in some instances to minimize the discharge of pollutants.

4. Technology-Based Effluent Limits (BPT/BAT/BCT): Non-Numeric Effluent Limits

a. Minimize Exposure

Minimize the exposure of raw, final, or waste materials to rain, snow, snowmelt, and runoff. To the extent

technologically available and economically practicable and achievable, either locate industrial materials and activities inside or protect them with storm resistant coverings in order to minimize exposure to rain, snow, snowmelt, and runoff (although significant enlargement of impervious surface area is not recommended). In minimizing exposure, pay particular attention to the following areas:

Loading and unloading areas: locate in roofed or covered areas where feasible; use grading, berming, or curbing around the loading area to divert run-on; locate the loading and unloading equipment and vehicles so that leaks are contained in existing containment and flow diversion systems.

Material storage areas: locate indoors, or in roofed or covered areas where feasible; install berms/dikes around these areas; use dry cleanup methods.

Note: Industrial materials do not need to be enclosed or covered if stormwater runoff from affected areas will not be discharged to receiving waters.

b. Good Housekeeping

Keep clean all exposed areas that are potential sources of pollutants, using such measures as sweeping at regular intervals, keeping materials orderly and labeled, and stowing materials in appropriate containers.

As part of the developed good housekeeping program, include a cleaning and maintenance program for all impervious areas of the facility where particulate matter, dust, or debris may accumulate, especially areas where material loading and unloading, storage, handling, and processing occur; and where practicable, the paving of areas where vehicle traffic or material storage occur but where vegetative or other stabilization methods are not practicable (institute a sweeping program in these areas too). For unstabilized areas where sweeping is not practicable, consider using stormwater management devices such as sediment traps, vegetative buffer strips, filter fabric fence, sediment filtering boom, gravel outlet protection, or other equivalent measures that effectively trap or remove sediment.

c. Maintenance

Maintain all control measures which are used to achieve the effluent limits required by this permit in effective operating

condition. Nonstructural control measures must also be diligently maintained (e.g., spill response supplies available, personnel appropriately trained). If control measures need to be replaced or repaired, make the necessary repairs or modifications as expeditiously as practicable.

d. Spill Prevention and Response Procedures

You must minimize the potential for leaks, spills and other releases that may be exposed to stormwater and develop plans for effective response to such spills if or when they occur. At a minimum, you must implement:

(1) Procedures for plainly labeling containers (e.g., "Used Oil", "Spent Solvents", "Fertilizers and Pesticides", etc.) that could be susceptible to spillage or leakage to encourage proper handling and facilitate rapid response if spills or leaks occur;

(2) Preventive measures such as barriers between material storage and traffic areas, secondary containment provisions, and procedures for material storage and handling;

(3) Procedures for expeditiously stopping, containing, and cleaning up leaks, spills, and other releases. Employees who may cause, detect or respond to a spill or lead must be trained in these procedures and have necessary spill response equipment available. If possible, one of these individuals should be a member of your storm water pollution prevention team; and

(4) Procedures for notification of appropriate facility personnel, emergency response agencies, and regulatory agencies. State or local requirements may necessitate reporting spills or discharges to local emergency response, public health, or drinking water supply agencies. Contact information must be in locations that are readily accessible and available.

(5) Procedures for documenting where potential spills and leaks could occur that could contribute pollutants to stormwater discharges, and the corresponding outfalls that would be affected by such spills and leaks.

(6) A procedure for documenting all significant spills and leaks of oil or toxic or hazardous pollutants that actually occurred

at exposed areas, or that drained to a stormwater conveyance.

e. Erosion and Sediment Controls

Through the use of structural and/or non-structural control measures stabilize, and contain runoff from, exposed areas to minimize onsite erosion and sedimentation, and the resulting discharge of pollutants. Among other actions to meet this limit, place flow velocity dissipation devices at discharge locations and within outfall channels where necessary to reduce erosion and/or settle out pollutants. In selecting, designing, installing, and implementing appropriate control measures, you are encouraged to check out information from both the State and EPA websites. The following two websites are given as information sources:

http://www.in.gov/idem/4899.htm and
http://cfpub.epa.gov/npdes/stormwater/menuofbmps/index.cfm

f. Management of Runoff

Divert, infiltrate, reuse, contain or otherwise reduce stormwater runoff, to minimize pollutants in the discharge.

g. Salt Storage Piles or Piles Containing Salt

Enclose or cover storage piles of salt, or piles containing salt, used for deicing or other commercial or industrial purposes, including maintenance of paved surfaces. You must implement appropriate measures (e.g., good housekeeping, diversions, containment) to minimize exposure resulting from adding to or removing materials from the pile. Piles do not need to be enclosed or covered if storm water runoff from the piles is not discharged.

h. Waste, Garbage, and Floatable Debris

Ensure that waste, garbage, and floatable debris are not discharged to receiving waters by keeping exposed areas free of such materials or by intercepting them before they are discharged.

i. Employee Training

Train all employees who work in areas where industrial material or activities are exposed to stormwater, or who are responsible for implementing activities necessary to meet the conditions of this permit (e.g., inspectors, maintenance personnel), including all members of your Pollution Prevention Team. Training must cover the specific control measures used to achieve the effluent limits in

this part, and monitoring, inspection, planning, reporting, and documentation requirements in other parts of this permit.

j. Non-Stormwater Discharges

You must determine if any non-stormwater discharges not authorized by an NPDES permit exist. Any non-stormwater discharges discovered must either be eliminated or modified into this permit.

k. Dust Generation and Vehicle Tracking of Industrial Materials

You must minimize generation of dust and off-site tracking of raw, final, or waste materials.

l. Fugitive Dust Emission.

Minimize fugitive dust emissions from coal handling areas. To minimize the tracking of coal dust offsite, consider procedures such as installing specially designed tires or washing vehicles in a designated area before they leave the site and controlling the wash water.

m. Delivery Vehicles

Minimize contamination of stormwater runoff from delivery vehicles arriving at the plant site. Consider procedures to inspect delivery vehicles arriving at the plant site and ensure overall integrity of the body or container and procedures to deal with leakage or spillage from vehicles or containers.

n. Fuel Oil Unloading Areas

Minimize contamination of precipitation or surface runoff from fuel oil unloading areas. Consider using containment curbs in unloading areas, having personnel familiar with spill prevention and response procedures present during deliveries to ensure that any leaks or spills are immediately contained and cleaned up, and using spill and overflow protection devices (e.g., drip pans, drip diapers, or other containment devices placed beneath fuel oil connectors to contain potential spillage during deliveries or from leaks at the connectors).

o. Chemical Loading and Unloading

Minimize contamination of precipitation or surface runoff from chemical loading and unloading areas. Consider using containment curbs at chemical loading and unloading areas to contain spills, having personnel familiar with spill prevention and response procedures present during deliveries to ensure that any leaks or spills are immediately contained and cleaned up, and loading and unloading in covered areas and storing chemicals indoors.

p. Miscellaneous Loading and Unloading Areas

Minimize contamination of precipitation or surface runoff from loading and unloading areas. Consider covering the loading area; grading, berming, or curbing around the loading area to divert run-on; locating the loading and unloading equipment and vehicles so that leaks are contained in existing containment and flow diversion systems; or equivalent procedures.

q. Liquid Storage Tanks

Minimize contamination of surface runoff from above-ground liquid storage tanks. Consider protective guards around tanks, containment curbs, spill and overflow protection, dry cleanup methods, or equivalent measures.

r. Large Bulk Fuel Storage Tanks

Minimize contamination of surface runoff from large bulk fuel storage tanks. Consider containment berms (or their equivalent). You must also comply with applicable State and Federal laws, including Spill Prevention, Control and Countermeasure (SPCC) Plan requirements.

s. Spill Reduction Measures

Minimize the potential for an oil or chemical spill, or reference the appropriate part of your SPCC plan. Visually inspect as part of your routine facility inspection the structural integrity of all above-ground tanks, pipelines, pumps, and related equipment that may be exposed to stormwater, and make any necessary repairs immediately.

t. Oil-Bearing Equipment in Switchyards

Minimize contamination of surface runoff from oil-bearing equipment in switchyard areas. Consider using level grades and gravel surfaces to retard flows and limit the spread of spills, or collecting runoff in perimeter ditches.

u. Residue-Hauling Vehicles

Inspect all residue-hauling vehicles for proper covering over the load, adequate gate sealing, and overall integrity of the container body. Repair vehicles without load covering or adequate gate sealing, or with leaking containers or beds.

v. Ash Loading Areas

Reduce or control the tracking of ash and residue from ash loading areas. Clear the ash building floor and immediately adjacent roadways of spillage, debris, and excess water before departure of each loaded vehicle.

w. Areas Adjacent to Disposal Ponds or Landfills

Minimize contamination of surface runoff from areas adjacent to disposal ponds or landfills. Reduce ash residue that may be tracked on to access roads traveled by residue handling vehicles, and reduce ash residue on exit roads leading into and out of residue handling areas.

x. Landfills, Scrap yards, Surface Impoundments, Open Dumps, General Refuse Sites

Minimize the potential for contamination of runoff from these areas.

5. Corrective Actions – Conditions Requiring Review

If any of the following conditions occur, you must review and revise the selection, design, installation, and implementation of your control measures to ensure that the condition is eliminated and will not be repeated (except for f, which may or may not require changes):

a. an authorized release or discharge (e.g., spill, leak, or discharge of non-stormwater not authorized by this NPDES permit) occurs at this facility;

b. a discharge that violates a numeric effluent limit;

c. it is determined that your control measures are not stringent enough to for the discharge to meet applicable water quality standards;

d. an inspection at your facility determines that modifications to the control measures are necessary to meet the non-numeric effluent limits in this permit;

e. it is determined in your routine facility inspection or an inspection by EPA or IDEM that modifications to the control measures are necessary to meet the non-numeric effluent limits in this permit; or

f. construction or a change in design, operation, or maintenance at your facility that significantly changes the nature of pollutants discharged in stormwater from your facility, or significantly increases the quantity of pollutants discharge.

g. Upon written notice by the Commissioner that the SWP3 proves to be ineffective in controlling pollutants in storm water discharges exposed to industrial activity.

6. Corrective Action Deadlines

You must document your discovery of any of the conditions listed in Part I.D.5 within thirty (30) days of making such discovery. Subsequently, within one-hundred and twenty (120) days of such discovery, you must document any corrective action(s) to be taken to eliminate or further investigate the deficiency or if no corrective action is needed, the basis for that determination. Specific documentation required within 30 and 120 days is detailed below. If you determine that changes to your control measures are necessary following your review, any modifications to your control measures must be made before the next storm event if possible, or as soon as practicable following that storm event. These time intervals are not grace periods, but schedules considered reasonable for the documenting of your findings and for making repairs and improvements. They are included in this permit to ensure that the conditions prompting the need for these repairs and improvements are not allowed to persist indefinitely.

7. Corrective Action Report

Within 30 days of a discovery of any condition listed in Part I.D.5, you must document the following information:

a. Brief description of the condition triggering corrective action;

b. Date condition identified; and

c. How deficiency identified.

Within 120 days of discovery of any condition listed in Part I.D.5, you must document the following information:

a. Summary of corrective action taken or to be taken (or, for triggering events identified in Part I.D.5.f, where you determine that corrective action is not necessary, the basis for this determination)

b. Notice of whether SWPPP modifications are required as a result of this discovery or corrective action;

c. Date corrective action initiated; and

d. Date corrective action completed or expected to be completed.

8. Inspections

The inspections in this Part must be conducted at this facility.

a. At a minimum, quarterly inspection of the stormwater management measures and stormwater run-off conveyances. The routine inspections must be performed by qualified personnel with at least one member of your storm water pollution prevention team. Inspections must be documented and either contained in, or have the on-site record keeping location referenced in, the SWP3.

b. Routine Facility Inspection Documentation – You must document the findings of each routine facility inspection performed and maintain this documentation with your SWPPP or have the on-site record keeping location referenced in the SWPPP. At a minimum, your documentation must include:

(1) The inspection date and time;

(2) The name(s) and signature(s) of the inspectors;

(3) Weather information and a description of any discharges occurring at the time of the inspection;

(4) Any previously unidentified discharges of pollutants from the site;

(5) Any control measures needing maintenance or

repairs;

(6) Any failed control measures that need replacement;

(7) Any incidents of noncompliance observed; and

(8) Any additional control measures needed to comply with the permit requirements.

Any corrective action required as a result of a routine facility inspection must be performed consistent with Part I.D.5 of this permit.

c. Comprehensive Site Compliance Evaluation

Qualified personnel shall conduct a comprehensive site compliance evaluation, at least once per year, to confirm the accuracy of the description of potential pollution sources contained in the plan, determine the effectiveness of the plan, and assess compliance with the permit. Such evaluations shall provide:

(1) Areas contributing to a stormwater discharge associated with industrial activity shall be visually inspected for evidence of, or the potential for, pollutants entering the drainage system. Measures to reduce pollutant loadings shall be evaluated to determine whether they are adequate and properly implemented in accordance with the terms of the permit or whether additional control measures are needed. Structural storm water management measures, sediment and erosion control measures, and other structural pollution prevention measures identified in the plan shall be observed to ensure that they are operating correctly. A visual inspection of equipment needed to implement the plan, such as spill response equipment, shall be made.

As part of the routine inspections, address all potential sources of pollutants, including (if applicable) air pollution control equipment (e.g., baghouses, electrostatic precipitator, scrubbers, and cyclones), for any signs of degradation (e.g., leaks, corrosion, or improper operation) that could limit their efficiency and lead to excessive emissions. Considering monitoring air flow at inlets and outlets (or use equivalent measures) to check for leaks (e.g., particulate deposition) or blockage in ducts. Also inspect all process and material handling equipment (e.g., conveyors, cranes, and vehicles) for leaks, drips, or the potential loss of material; and material storage areas (e.g.,

piles, bins, or hoppers for storing coke, coal, scrap, or slag, as well as chemicals stored in tanks and drums) for signs of material loss due to wind or stormwater runoff.

(2) Comprehensive Site Compliance Inspection. As part of your inspection, inspect the following areas monthly: coal handling areas, loading or unloading areas, switchyards, fueling areas, bulk storage areas, ash handling areas, areas adjacent to disposal ponds and landfills, maintenance areas, liquid storage tanks, and long term and short term material storage areas.

(3) Based on the results of the evaluation, the description of potential pollutant sources identified in the plan in accordance with Part I.E.2.b of this permit and pollution prevention measures and controls identified in the plan in accordance with Part I.D.4. of this permit shall be revised as appropriate within the timeframes contained in Part I.D.6 of this permit.

(4) A report summarizing the scope of the evaluation, personnel making the evaluation, the date(s) of the evaluation, major observations relating to the implementation of the storm water pollution prevention plan, and actions taken in accordance with the above paragraph must be documented and either contained in, or have on-site record keeping location referenced in, the SWP3 at least 3 years after the date of the evaluation. The report shall identify any incidents of noncompliance. Where a report does not identify any incidents of noncompliance, the report shall contain a certification that the facility is in compliance with the storm water pollution prevention plan and this permit. The report shall be signed in accordance with the signatory requirements of Part II.C.6 of this permit.

(5) Where compliance evaluation schedules overlap the inspections required under Part 8.a. above, the compliance evaluation may be conducted in place of one such inspection.

## E. STORM WATER POLLUTION PREVENTION PLAN

### 1. Development of Plan

Within 12 months from the effective date of this permit, the permittee is required to revise and update the current Storm Water Pollution

Prevention Plan (SWP3) for the permitted facility. The plan shall at a minimum include the following:

a. Identify potential sources of pollution, which may reasonably be expected to affect the quality of storm water discharges associated with industrial activity from the facility. Storm water associated with industrial activity (defined in 40 CFR 122.26(b)(14)) includes, but is not limited to, the discharge from any conveyance which is used for collecting and conveying storm water and which is directly related to manufacturing, processing or materials storage areas at an industrial plant;

b. Describe practices and measure to be used in reducing the potential for pollutants to be exposed to storm water; and

c. Assure compliance with the terms and conditions of this permit.

2. Contents

The plan shall include, at a minimum, the following items:

a. Pollution Prevention Team -The plan shall list, by position title, the member or members of the facility organization as members of a storm water Pollution Prevention Team who are responsible for developing the storm water pollution prevention plan (SWP3) and assisting the facility or plant manager in its implementation, maintenance, and revision. The plan shall clearly identify the responsibilities of each storm water pollution prevention team member. Each member of the stormwater pollution prevention team must have ready access to either an electronic or paper copy of applicable portions of this permit and your SWPPP.

b. Description of Potential Pollutant Sources – The plan shall provide a description of areas at the site exposed to industrial activity and have a reasonable potential for storm water to be exposed to pollutants. The plan shall identify all activities and significant materials (defined in 40 CFR 122.26(b)), which may potentially be significant pollutant sources. As a minimum, the plan shall contain the following:

(1) A soils map indicating the types of soils found on the facility property and showing the boundaries of the facility property.

(2) A graphical representation, such as an aerial photograph or site layout maps, drawn to an appropriate scale, which contains a legend and compass coordinates, indicating, at a

minimum, the following:

(A) All on-site storm water drainage and discharge conveyances, which may include pipes, ditches, swales, and erosion channels, related to a storm water discharge.

(B) Known adjacent property drainage and discharge conveyances, if directly associated with run-off from the facility.

(C) All on-site and known adjacent property water bodies, including wetlands and springs.

(D) An outline of the drainage area for each outfall.

(E) An outline of the facility property, indicating directional flows, via arrows, of surface drainage patterns.

(F) An outline of impervious surfaces, which includes pavement and buildings, and an estimate of the impervious and pervious surface square footage for each drainage area placed in a map legend.

(G) On-site injection wells, as applicable.

(H) On-site wells used as potable water sources, as applicable.

(I) All existing major structural control measures to reduce pollutants in storm water run-off.

(J) All existing and historical underground or aboveground storage tank locations, as applicable.

(K) All permanently designated plowed or dumped snow storage locations.

(L) All loading and unloading areas for solid and liquid bulk materials.

(M) All existing and historical outdoor storage areas for raw materials, intermediary products, final products, and waste materials. Include materials handled at the site that potentially may be exposed to precipitation or runoff, areas where deposition of

particulate matter from process air emissions or losses during material-handling activities.

(N) All existing or historical outdoor storage areas for fuels, processing equipment, and other containerized materials, for example, in drums and totes.

(O) Outdoor processing areas.

(P) Dust or particulate generating process areas.

(Q) Outdoor assigned waste storage or disposal areas.

(R) Pesticide or herbicide application areas.

(S) Vehicular access roads.

(T) Identify any storage or disposal of wastes such as spent solvents and baths, sand, slag and dross; liquid storage tanks and drums; processing areas including pollution control equipment (e.g., baghouses); and storage areas of raw material such as coal, coke, scrap, sand, fluxes, refractories, or metal in any form. In addition, indicate where an accumulation of significant amounts of particulate matter could occur from such sources as furnace or oven emissions, losses from coal and coke handling operation, etc., and could result in a discharge of pollutants.

(U) The mapping of historical locations is only required if the historical locations have a reasonable potential for stormwater exposure to historical pollutants.

(3) An area site map that indicates:

(A) The topographic relief or similar elevations to determine surface drainage patterns;

(B) The facility boundaries;

(C) All receiving waters; and

(D) All known drinking water wells; and

Includes at a minimum, the features in clauses (A), (C), and (D) within a one-fourth (1/4) mile radius beyond the property boundaries of the facility. This map must be to scale and include a legend and compass coordinates.

(4) A narrative description of areas that generate stormwater discharges exposed to industrial activity including descriptions for any existing or historical areas listed in subdivision 2.b.(2)(J) through (S) of this Part, and any other areas thought to generate storm water discharges exposed to industrial activity. The narrative descriptions for each identified area must include the following:

(A) Type and typical quantity of materials present in the area.

(B) Methods of storage, including presence of any secondary containment measures.

(C) Any remedial actions undertaken in the area to eliminate pollutant sources or exposure of storm water to those sources. If a corrective action plan was developed, the type of remedial action and plan date shall be referenced.

(D) Any significant release or spill history dating back a period of three (3) years from the effective date of this permit, in the identified area, for materials spilled outside of secondary containment structures and impervious surfaces in excess of their reportable quantity, including the following:

i. The date and type of material released or spilled.

ii. The estimated volume released or spilled.

iii. A description of the remedial actions undertaken, including disposal or treatment.

Depending on the adequacy or completeness of the remedial actions, the spill history shall be used to determine additional pollutant sources that may be exposed to storm water. In subsequent permit terms, the history shall date back for a period of five (5) years from the date of the permit renewal application.

(E) Where the chemicals or materials have the potential to be exposed to storm water discharges, the descriptions for each identified area must include a risk identification analysis of chemicals or materials stored or used within the area. The analysis must include the following:

i. Toxicity data of chemicals or materials used within the area, referencing appropriate material safety data sheet information locations.

ii. The frequency and typical quantity of listed chemicals or materials to be stored within the area.

iii. Potential ways in which storm water discharges may be exposed to listed chemicals and materials.

iv. The likelihood of the listed chemicals and materials to come into contact with water.

(5) A narrative description of existing and planned management practices and measures to improve the quality of storm water run-off entering a water of the state. Descriptions must be created for existing or historical areas listed in subdivision 2.b.(2)(J) through (S) and any other areas thought to generate storm water discharges exposed to industrial activity. The description must include the following:

(A) Any existing or planned structural and nonstructural control practices and measures.

(B) Any treatment the storm water receives prior to leaving the facility property or entering a water of the state.

(C) The ultimate disposal of any solid or fluid wastes collected in structural control measures other than by discharge.

(6) Describe areas that due to topography, activities, or other factors have a high potential for significant soil erosion.

(7) Document the location of any storage piles containing salt used for deicing.

(8) Information or other documentation required under subsection (d) of this plan.

(9) The results of stormwater monitoring. The monitoring data must include completed field data sheets, chain-of-custody forms, and laboratory results. If the monitoring data are not placed into the facility's SWP3, the on-site location for storage of the information must be reference in the SWP3.

(10) Drainage Area Site Map. Document in your SWPPP the locations of any of the following activities or sources that may be exposed to precipitation or surface runoff: storage tanks, scrap yards, and general refuse areas; short- and long-term storage of general materials (including but not limited to supplies, construction materials, paint equipment, oils, fuels, used and unused solvents, cleaning materials, paint, water treatment chemicals, fertilizer, and pesticides); landfills and construction sites; and stock pile areas (e.g., coal or limestone piles).

(11) Documentation of Good Housekeeping Measures. You must document in your SWPPP the good housekeeping measures implemented to meet the effluent limits in Part I.D.4 of this NPDES permit.

c. Non-Stormwater Discharges – You must document that you have evaluated for the presence of non-storm water discharges not authorized by an NPDES permit. Any non-stormwater discharges have either been eliminated or incorporated into this permit. Documentation of non-storm water discharges shall include:

(1) A written non-storm water assessment, including the following:

(A) A certification letter stating that storm water discharges entering a water of the state have been evaluated for the presence of illicit discharges and non-stormwater contributions.

(B) Detergent or solvent-based washing of equipment or vehicles that would allow washwater additives to enter any storm water only drainage system shall not be allowed at this facility unless appropriately permitted under this NPDES permit.

(C) All interior maintenance area floor drains with the potential for maintenance fluids or other materials to enter stormwater only storm sewers must be either sealed, connected to a sanitary sewer with prior authorization, or appropriately permitted under this NPDES permit. The sealing, sanitary sewer connecting, or permitting of drains under this item must be documented in the written non-storm water assessment program.

(D) The certification shall include a description of the method used, the date of any testing, and the on-site drainage points that were directly observed during the test.

d. General Requirements – The SWP3 must meet the following general requirements:

(1) The plan shall be certified by a qualified professional. The term qualified professional means an individual who is trained and experienced in water treatment techniques and related fields as may be demonstrated by state registration, professional certification, or completion of course work that enable the individual to make sound, professional judgments regarding storm water control/treatment and monitoring, pollutant fate and transport, and drainage planning.

(2) The plan shall be retained at the facility and be available for review by a representative of the Commissioner upon request. IDEM may provide access to portions of your SWP3 to the public.

(3) The plan must be revised and updated as required. Revised and updated versions of the plan must be implemented on or before three hundred sixty-five (365) days from the effective date of this permit. The Commissioner may grant an extension of this time frame based on a request by the person showing reasonable cause.

(4) If the permittee has other written plans, required under applicable federal or state law, such as operation and maintenance, spill prevention control and countermeasures (SPCC), or risk contingency plans, which fulfill certain requirements of an SWP3, these plans may be referenced, at the permittee's discretion, in the appropriate sections of

the SWP3 to meet those section requirements.

(5) The permittee may combine the requirements of the SWP3 with another written plan if:

(A) The plan is retained at the facility and available for review;

(B) All the requirements of the SWP3 are contained within the plan; and

(C) A separate, labeled section is utilized in the plan for the SWP3 requirements.

F. CHRONIC BIOMONITORING PROGRAM REQUIREMENTS

To adequately assess the character of the effluent, and the effects of the effluent on aquatic life, the permittee shall conduct Whole Effluent Toxicity Testing. Part 1 of this section describes the testing procedures, Part 2 describes the Toxicity Reduction Evaluation which is only required if the effluent demonstrated toxicity, as described in section 1.f.

1. Whole Effluent Toxicity Tests

Within 90 days of the start-up of the IGCC station, the permittee shall initiate the series of bioassay tests described below to monitor the toxicity of the discharge from Outfall 002. If toxicity is demonstrated as defined under section f. below, the permittee is required to conduct a toxicity reduction evaluation (TRE).

a. Bioassay Test Procedures and Data Analysis

(1) All test organisms, test procedures and quality assurance criteria used shall be in accordance with the Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Water to Freshwater Organisms; Fourth Edition Section 13, Cladoceran (*Ceriodaphnia dubia*) Survival and Reproduction Test Method 1002.0; and Section 11, Fathead Minnow (*Pimephales promelas*) Larval Survival and Growth Test Method, (1000.0) EPA 821-R-02-013, October 2002, or most recent update.

(2) Any circumstances not covered by the above methods, or that required deviation from the specified methods shall first be approved by the IDEM's Environmental Toxicology and Chemistry Section.

(3) The determination of effluent toxicity shall be made in accordance with the Data Analysis general procedures for chronic toxicity endpoints as outlined in Section 9, and in Sections 11 and 13 of the respective Test Method (1000.0 and 1002.0) of Short-term Methods of Estimating the Chronic Toxicity of Effluent and Receiving Water to Freshwater Organisms (EPA-821-R-02-013), Fourth Edition, October 2002, or most recent update.

b. Types of Bioassay Tests

The permittee shall conduct 7-day Daphnid (*Ceriodaphnia dubia*) Survival and Reproduction Test and a 7-day Fathead Minnow (*Pimephales promelas*) Larval Survival and Growth Test on samples of final effluent. All tests will be conducted on 24-hour composite samples of final effluent. All test solutions shall be renewed daily. On days three and five fresh 24-hour composite samples of the effluent collected on alternate days shall be used to renew the test solutions.

If, in any control, more than 10% of the test organisms die in 96 hours, or more than 20% of the test organisms die in 7 days, that test shall be repeated. In addition, if in the *Ceriodaphnia* test control the number of newborns produced per surviving female is less than 15, or if 60% of surviving control females have less than three broods; and in the fathead minnow test if the mean dry weight of 7-day old surviving fish in the control group is less than 0.25 mg, that test shall also be repeated. Such testing will determine whether the effluent affects the survival, reproduction, and/or growth of the test organisms. Results of all tests regardless of completion must be reported to IDEM.

c. Effluent Sample Collection and Chemical Analysis

(1) Samples taken for the purposes of Whole Effluent Toxicity Testing will be taken at a point that is representative of the discharge, but prior to discharge. The maximum holding time for whole effluent is 36 hours for a 24 hour composite sample. Bioassay tests must be started within 36 hours after termination of the 24 hour composite sample collection. Bioassay of effluent sampling may be coordinated with other permit sampling requirements as appropriate to avoid duplication.

(2) Chemical analysis must accompany each effluent sample taken for bioassay test, especially the sample taken for the repeat or confirmation test as outlined in section f.3. below. The analysis detailed under Part I.A. should be conducted for the effluent sample. Chemical analysis must comply with approved EPA test methods.

d. Testing Frequency and Duration

The chronic toxicity test specified in section b. above shall be conducted monthly for a period of three consecutive months. If toxicity is demonstrated, as defined in paragraph f, the permittee is required to conduct a toxicity reduction evaluation (TRE) as specified in Part 2 (Toxicity Reduction Evaluation (TRE) Schedule of Compliance). In the absence of toxicity with either species in the monthly testing for three (3) months in the current tests, sensitive species will be selected based on frequency and failure of whole effluent toxicity tests with one or the other species in the immediate past.

If no toxicity is demonstrated, as defined in section f. below the testing frequency shall be reduced to once every quarter for the duration of the permit. After three tests have been completed, that indicate no toxicity, the permittee may reduce the number of species tested to only include the most sensitive to the toxicity in the effluent.

e. Reporting

(1) Results shall be reported according to EPA 821-R-02-013, October 2002, Section 10 (Report Preparation). Two copies of the completed report for each test shall be submitted to the Compliance Data Section, Office of Water Quality of the IDEM no later than sixty days after completion of the test.

(2) For quality control, the report shall include the results of appropriate standard reference toxic pollutant tests for chronic endpoints and historical reference toxic pollutant data with mean values and appropriate ranges for the respective test species *Ceriodaphnia dubia* and *Pimephales promelas*. Biomonitoring reports must also include copies of Chain-of-Custody Records and Laboratory raw data sheets.

(3) Statistical procedures used to analyze and interpret toxicity data including critical values of significance to evaluate

each point of toxicity should be described and included as part of the biomonitoring report.

f. Demonstration of Toxicity

(1) Acute toxicity will be demonstrated if the effluent is observed to have exceeded 1.0 $TU_a$ (acute toxic units) based on 100% effluent for the test organism in 48 and 96 hours for *Ceriodaphnia dubia* or *Pimephales promelas*, respectively.

(2) Chronic toxicity will be demonstrated if the effluent is observed to have exceeded 16 $TU_c$ (chronic toxic units) for *Ceriodaphnia dubia* or *Pimephales promelas.*

(3) If toxicity is found in any of the tests as specified above, a confirmation toxicity test using the specified methodology and same test species shall be conducted within two weeks of the completion of the failed test to confirm results. During the sampling for any confirmation test the permittee shall also collect and preserve sufficient effluent samples for sue in any Toxicity Identification Evaluation (TIE) and/or Toxicity Reduction Evaluation (TRE), if necessary. If any two (2) consecutive tests, including any and all confirmation tests, indicate the presence of toxicity, the permittee must begin the implementation of a Toxicity Reduction Evaluation (TRE) as described below. The whole effluent toxicity tests required above may be suspended (upon approval from IDEM) while the TRE/TIE are being conducted.

g. Definitions

(1) $TU_c$ is defined as 100/NOEC or $100/IC_{25}$, where the NOEC or $IC_{25}$ are expressed as a percent effluent in the test medium.

(2) $TU_a$ is defined as $100/LC_{50}$ where the $LC_{50}$ is expressed as a percent effluent in the test medium of an acute whole effluent toxicity (WET) test that is statistically or graphically estimated to be lethal to fifty percent (50%) of the test organisms.

(3) "Inhibition concentration 25" or "$IC_{25}$" means the toxicant (effluent) concentration that would cause a twenty-five percent (25%) reduction in a nonquantal biological measurement for the test population. For example, the $IC_{25}$

is the concentration of toxicant (effluent) that would cause a twenty-five percent (25%) reduction in mean young per female or in growth for the test population.

(4) "No observed effect concentration" or "NOEC" is the highest concentration of toxicant (effluent) to which organisms are exposed in a full life cycle or partial life cycle (short term) test, that causes no observable adverse effects on the test organisms, that is, the highest concentration of toxicant (effluent) in which the values for the observed responses are not statistically significantly different from the controls.

2. Toxicity Reduction Evaluation (TRE) Schedule of Compliance

The development and implementation of a TRE (including any post-TRE biomonitoring requirements) is only required if toxicity is demonstrated as defined in Part 1, section f. above.

a. Development of TRE Plan

Within 90 days of determination of toxicity, the permittee shall submit plans for an effluent toxicity reduction evaluation (TRE) to the Compliance Data Section, Office of Water Quality of the IDEM. The TRE plan shall include appropriate measures to characterize the causative toxicants and the variability associated with these compounds. Guidance on conducting effluent toxicity reduction evaluations is available from EPA and from the EPA publications list below:

(1) Methods for Aquatic Toxicity Identification Evaluations:

Phase I Toxicity Characteristics Procedures, Second Edition (EPA/600/6-91/003, February 1991.

Phase II Toxicity Identification Procedures (EPA 600/R-92/080), September 1993.

Phase III Toxicity Confirmation Procedures (EPA 600/R-92/081), September 1993.

(2) Toxicity Identification Evaluation: Characterization of Chronically Toxic Effluents, Phase I. EPA/600/6-91/005F, May 1992.

(3) Generalized Methodology for Conducting Industrial Toxicity Reduction Evaluations (TREs), (EPA/600/2-88/070), April 1989.

(4) Toxicity Reduction Evaluation Protocol for Municipal Wastewater Treatments Plants (EPA/833-B-99-022) August 1999.

b. Conduct the Plan

Within 30 days after the submission of the TRE plan to IDEM, the permittee must initiate an effluent TRE consistent with the TRE plan. Progress reports shall be submitted every 90 days to the Compliance Data Section, Office of Water Quality of the IDEM beginning 90 days after initiation of the TRE study.

c. Reporting

Within 90 days of the TRE study completion, the permittee shall submit to the Compliance Data Section, Office of Water Quality of the IDEM, the final study results and a schedule for reducing the toxicity to acceptable levels through control of the toxicant source or treatment of whole effluent.

d. Compliance Date

The permittee shall complete items a, b, and c from Section 2 above and reduce the toxicity to acceptable levels as soon as possible, but no later than three years after the date of determination of toxicity.

e. Post-TRE Biomonitoring Requirements (Only Required After Completion of a TRE)

After the TRE, the permittee shall conduct monthly toxicity tests with 2 or more species for a period of three months. Should three consecutive monthly tests demonstrate no toxicity, the permittee may reduce the number of species tested to only include the species demonstrated to be most sensitive to the toxicity in the effluent, (see section 1.d. above for more specifics on this topic), and conduct chronic tests quarterly for the duration of the permit.

If toxicity is demonstrated, as defined in paragraph 1.f. above, after the initial three month period, testing must revert to a TRE as described in Part 2 (TRE) above.

G. REOPENING CLAUSES

This permit may be modified, or alternately, revoked and reissued, after public notice and opportunity for hearing:

1. to comply with any applicable effluent limitation or standard issued or approved under 301(b)(2)(C),(D) and (E), 304 (b)(2), and 307(a)(2) of the Clean Water Act, if the effluent limitation or standard so issued or approved:

   a. contains different conditions or is otherwise more stringent than any effluent limitation in the permit; or

   b. controls any pollutant not limited in the permit.

2. to incorporate any of the reopening clause provisions cited at 327 IAC 5-2-16.

3. to include whole effluent toxicity limitations or to include limitations for specific toxicants if the results of the biomonitoring and/or the TRE study indicate that such limitations are necessary to meet Indiana Water Quality Standards.

4. to include a case-specific Limit of Detection (LOD) and/or Limit of Quantitation (LOQ). The permittee must demonstrate that such action is warranted in accordance with the procedures specified under Appendix B, 40 CFR Part 136, using the most sensitive analytical methods approved by EPA under 40 CFR Part 136, or approved by the Commissioner.

5. to reduce the mercury monitoring frequency if twelve (12) months (six (6) consecutive samples) of monitoring data demonstrate there is not a reasonable potential for mercury to exceed Indiana water quality standards; or to include effluent limitations for mercury, if mercury is found to be discharged at a level that will cause, have the reasonable potential to cause, or contribute to an excursion above the mercury water quality criterion.

# PART II

## STANDARD CONDITIONS FOR NPDES PERMITS

### A. GENERAL CONDITIONS

1. Duty to Comply

The permittee shall comply with all terms and conditions of this permit in accordance with 327 IAC 5-2-8(1) and all other requirements of 327 IAC 5-2-8. Any permit noncompliance constitutes a violation of the Clean Water Act and IC 13 and is grounds for enforcement action or permit termination, revocation and reissuance, modification, or denial of a permit renewal application.

It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of the permit.

2. Duty to Mitigate

In accordance with 327 IAC 5-2-8(3), the permittee shall take all reasonable steps to minimize or correct any adverse impact to the environment resulting from noncompliance with this permit. During periods of noncompliance, the permittee shall conduct such accelerated or additional monitoring for the affected parameters, as appropriate or as requested by IDEM, to determine the nature and impact of the noncompliance.

3. Duty to Reapply

If the permittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the permittee must obtain and submit an application for renewal of this permit in accordance with 327 IAC 5-2-8(2). It is the permittee's responsibility to obtain and submit the application. In accordance with 327 IAC 5-2-3(c), the owner of the facility or operation from which a discharge of pollutants occurs is responsible for applying for and obtaining the NPDES permit, except where the facility or operation is operated by a person other than an employee of the owner in which case it is the operator's responsibility to apply for and obtain the permit. Pursuant to 327 IAC 5-3-2(a)(2), the application must be submitted at least 180 days before the expiration date of this permit. This deadline may be extended if:

a. permission is requested in writing before such deadline;

b. IDEM grants permission to submit the application after the deadline; and

c. the application is received no later than the permit expiration date.

4. Permit Transfers

In accordance with 327 IAC 5-2-8(4)(D), this permit is nontransferable to any person except in accordance with 327 IAC 5-2-6(c). This permit may be transferred to another person by the permittee, without modification or revocation and reissuance being required under 327 IAC 5-2-16(c)(1) or 16(e)(4), if the following occurs:

a. the current permittee notified the Commissioner at least thirty (30) days in advance of the proposed transfer date.

b. a written agreement containing a specific date of transfer of permit responsibility and coverage between the current permittee and the transferee (including acknowledgment that the existing permittee is liable for violations up to that date, and the transferee is liable for violations from that date on) is submitted to the Commissioner.

c. the transferee certifies in writing to the Commissioner their intent to operate the facility without making such material and substantial alterations or additions to the facility as would significantly change the nature or quantities of pollutants discharged and thus constitute cause for permit modification under 327 IAC 5-2-16(d). However, the Commissioner may allow a temporary transfer of the permit without permit modification for good cause, e.g., to enable the transferee to purge and empty the facility's treatment system prior to making alterations, despite the transferee's intent to make such material and substantial alterations or additions to the facility.

d. the Commissioner, within thirty (30) days, does not notify the current permittee and the transferee of the intent to modify, revoke and reissue, or terminate the permit and to require that a new application be filed rather than agreeing to the transfer of the permit.

The Commissioner may require modification or revocation and reissuance of the permit to identify the new permittee and incorporate such other requirements as may be necessary under the Clean Water Act or state law.

5. Permit Actions

In accordance with 327 IAC 5-2-16(b) and 327 IAC 5-2-8(4), this permit may be modified, revoked and reissued, or terminated for cause, including, but not limited to, the following:

a. Violation of any terms or conditions of this permit;

b. Failure of the permittee to disclose fully all relevant facts or misrepresentation of any relevant facts in the application, or during the permit issuance process; or

c. A change in any condition that requires either a temporary or a permanent reduction or elimination of any discharge controlled by the permit, e.g., plant closure, termination of discharge by connection to a POTW, a change in state law that requires the reduction or elimination of the discharge, or information indicating that the permitted discharge poses a substantial threat to human health or welfare.

Filing of either of the following items does not stay or suspend any permit condition: (1) a request by the permittee for a permit modification, revocation and reissuance, or termination, or (2) submittal of information specified in Part II.A.3 of the permit including planned changes or anticipated noncompliance.

The permittee shall submit any information that the permittee knows or has reason to believe would constitute cause for modification or revocation and reissuance of the permit at the earliest time such information becomes available, such as plans for physical alterations or additions to the permitted facility that:

1. could significantly change the nature of, or increase the quantity of pollutants discharged; or

2. the commissioner may request to evaluate whether such cause exists.

In accordance with 327 IAC 5-1-3(a)(5), the permittee must also provide any information reasonably requested by the Commissioner.

6. Property Rights

Pursuant to 327 IAC 5-2-8(6) and 327 IAC 5-2-5(b), the issuance of this permit does not convey any property rights of any sort or any exclusive privileges, nor does it authorize any injury to persons or private property or invasion of other private rights, any infringement of federal, state, or local laws or regulations. The issuance of the permit also does not preempt any duty to obtain any other state, or local assent required by law for the discharge or for the construction or operation of the facility from which a discharge is made.

7. Severability

In accordance with 327 IAC 1-1-3, the provisions of this permit are severable and, if any provision of this permit or the application of any provision of this permit to any person or circumstance is held invalid, the invalidity shall not affect any other provisions or applications of the permit which can be given effect without the invalid provision or application.

8. Oil and Hazardous Substance Liability

Nothing in this permit shall be construed to relieve the permittee from any responsibilities, liabilities, or penalties to which the permittee is or may be subject to under Section 311 of the Clean Water Act.

9. State Laws

Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties established pursuant to any applicable state law or regulation under authority preserved by Section 510 of the Clean Water Act or state law.

10. Penalties for Violation of Permit Conditions

Pursuant to IC 13-30-4, a person who violates any provision of this permit, the water pollution control laws; environmental management laws; or a rule or standard adopted by the Water Pollution Control Board is liable for a civil penalty not to exceed twenty-five thousand dollars ($25,000) per day of any violation.

Pursuant to IC 13-30-5, a person who obstructs, delays, resists, prevents, or interferes with (1) the department; or (2) the department's personnel or designated agent in the performance of an inspection or investigation performed under IC 13-14-2-2 commits a class C infraction.

Pursuant to IC 13-30-10-1.5(k), a person who willfully or recklessly violates any NPDES permit condition or filing requirement, any applicable standards or limitations of IC 13-18-3-2.4, IC 13-18-4-5, IC 13-18-8, IC 13-18-9, IC 13-18-10, IC 13-18-12, IC 13-18-14, IC 13-18-15, or IC 13-18-16, or who knowingly makes any false material statement, representation, or certification in any NPDES form, notice, or report commits a Class C misdemeanor.

An offense under IC 13-30-10-1.5(k) is a Class D felony if the offense results in damage to the environment that renders the environment unfit for human or vertebrate animal life. An offense under IC 13-30-10-1.5(k) is a Class C felony if the offense results in the death of another person.

11. Penalties for Tampering or Falsification

In accordance with 327 IAC 5-2-8(9), the permittee shall comply with monitoring, recording, and reporting requirements of this permit. The Clean Water Act, as well as IC 13-30-10, provides that any person who knowingly or intentionally (a) destroys, alters, conceals, or falsely certifies a record that is required to be maintained under the terms of a permit issued by the department; and may be used to determine the status of compliance, (b) renders inaccurate or inoperative a recording device or a monitoring device required to be maintained

by a permit issued by the department, or (c) falsifies testing or monitoring data required by a permit issued by the department commits a Class B misdemeanor.

12. Toxic Pollutants

If any applicable effluent standard or prohibition (including any schedule of compliance specified in such effluent standard or prohibition) is established under Section 307(a) of the Clean Water Act for a toxic pollutant injurious to human health, and that standard or prohibition is more stringent than any limitation for such pollutant in this permit, this permit shall be modified or revoked and reissued to conform to the toxic effluent standard or prohibition in accordance with 327 IAC 5-2-8(5). Effluent standards or prohibitions established under Section 307(a) of the Clean Water Act for toxic pollutants injurious to human health are effective and must be complied with, if applicable to the permittee, within the time provided in the implementing regulations, even absent permit modification.

13. Wastewater treatment plant and certified operators

The permittee shall have the wastewater treatment facilities under the responsible charge of an operator certified by the Commissioner in a classification corresponding to the classification of the wastewater treatment plant as required by IC 13-18-11-11 and 327 IAC 5-22. In order to operate a wastewater treatment plant the operator shall have qualifications as established in 327 IAC 5-22-7.

327 IAC 5-22-10(b) provides that a certified operator may be designated as being in responsible charge of more than one (1) wastewater treatment plant, if it can be shown that he will give adequate supervision to all units involved. Adequate supervision means that sufficient time is spent at the plant on a regular basis to assure that the certified operator is knowledgeable of the actual operations and that test reports and results are representative of the actual operations conditions. In accordance with 327 IAC 5-22-3(10), "responsible charge" means the person responsible for the overall daily operation, supervision, or management of a wastewater facility.

Pursuant to 327 IAC 5-22-10(a), the permittee shall notify IDEM when there is a change of the person serving as the certified operator in responsible charge of the wastewater treatment facility. The notification shall be made no later than thirty (30) days after a change in the operator.

14. Construction Permit

In accordance with IC 13-14-8-11.6, a discharger is not required to obtain a state permit for the modification or construction of a water pollution treatment or control facility if the discharger has an effective NPDES permit.

If the discharger modifies their existing water pollution treatment or control facility or constructs a new water pollution treatment or control facility for the

treatment or control of any new influent pollutant or increased levels of any existing pollutant, then, within thirty (30) days after commencement of operation, the discharger shall file with the Department of Environment Management a notice of installation for the additional pollutant control equipment and a design summary of any modifications.

The notice and design summary shall be sent to the Office of Water Quality - Mail Code 65-42, Industrial NPDES Permits Section, 100 North Senate Avenue, Indianapolis, IN 46204-2251.

15. Inspection and Entry

In accordance with 327 IAC 5-2-8(7), the permittee shall allow the Commissioner, or an authorized representative, (including an authorized contractor acting as a representative of the Commissioner) upon the presentation of credentials and other documents as may be required by law, to:

a. Enter upon the permittee's premises where a point source, regulated facility, or activity is located or conducted, or where records must be kept pursuant to the conditions of this permit;

b. Have access to and copy, at reasonable times, any records that must be kept under the terms and conditions of this permit;

c. Inspect at reasonable times any facilities, equipment or methods (including monitoring and control equipment), practices, or operations regulated or required pursuant to this permit; and

d. Sample or monitor at reasonable times, any discharge of pollutants or internal wastestreams for the purposes of evaluating compliance with the permit or as otherwise authorized.

B. MANAGEMENT REQUIREMENTS

1. Proper Operation and Maintenance

The permittee shall at all times maintain in good working order and efficiently operate all facilities and systems (and related appurtenances) for the collection and treatment which are installed or used by the permittee and which are necessary for achieving compliance with the terms and conditions of this permit in accordance with 327 IAC 5-2-8(8).

Neither 327 IAC 5-2-8(8), nor this provision, shall be construed to require the operation of installed treatment facilities that are unnecessary for achieving compliance with the terms and conditions of the permit.

2. Bypass of Treatment Facilities

Pursuant to 327 IAC 5-2-8(11):

a. Terms as defined in 327 IAC 5-2-8(11)(A):

(1) "Bypass" means the intentional diversion of a waste stream from any portion of a treatment facility.

(2) "Severe property damage" means substantial physical damage to property, damage to the treatment facilities which would cause them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.

b. The permittee may allow a bypass to occur that does not cause a violation of the effluent limitations in the permit, but only if it is also for essential maintenance to assure efficient operation. These bypasses are not subject to the provisions of Part II.B.2.c., e, and f of this permit.

c. Bypasses, as defined in (a) above, are prohibited, and the Commissioner may take enforcement action against a permittee for bypass, unless the following occur:

(1) The bypass was unavoidable to prevent loss of life, personal injury, or severe property damage, as defined above;

(2) There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass that occurred during normal periods of equipment downtime or preventive maintenance; and

(3) The permittee submitted notices as required under Part II.B.2.e; or

(4) The condition under Part II.B.2.b above is met.

d. Bypasses that result in death or acute injury or illness to animals or humans must be reported in accordance with the "Spill Response

and Reporting Requirements" in 327 IAC 2-6.1, including calling 888/233-7745 as soon as possible, but within two (2) hours of discovery.

e. The permittee must provide the Commissioner with the following notice:

(1) If the permittee knows or should have known in advance of the need for a bypass (anticipated bypass), it shall submit prior written notice. If possible, such notice shall be provided at least ten (10) days before the date of the bypass for approval by the Commissioner.

(2) The permittee shall orally report an unanticipated bypass that exceeds any effluent limitations in the permit within 24 hours of becoming aware of the bypass noncompliance. The permittee must also provide a written report within five (5) days of the time the permittee becomes aware of the bypass event. The written report must contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times; if the cause of noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate and prevent recurrence of the bypass event.

f. The Commissioner may approve an anticipated bypass, after considering its adverse effects, if the Commissioner determines that it will meet the conditions listed above in Part II.B.2.c. The Commissioner may impose any conditions determined to be necessary to minimize any adverse effects.

3. Upset Conditions

Pursuant to 327 IAC 5-2-8(12):

a. "Upset" means an exceptional incident in which there is unintentional and temporary noncompliance with technology-based permit effluent limitations because of factors beyond the reasonable control of the permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation.

b. An upset shall constitute an affirmative defense to an action brought for noncompliance with such technology-based permit

effluent limitations if the requirements of Paragraph c of this section, are met.

c. A permittee who wishes to establish the affirmative defense of upset shall demonstrate, through properly signed, contemporaneous operating logs or other relevant evidence, that:

(1) An upset occurred and the permittee has identified the specific cause(s) of the upset, if possible;

(2) The permitted facility was at the time being operated in compliance with proper operation and maintenance procedures;

(3) The permittee complied with any remedial measures required under Part II.A.2; and

(4) The permittee submitted notice of the upset as required in the "Twenty-Four Hour Reporting Requirements," Part II.C.3, or 327 IAC 2-6.1, whichever is applicable.

4. Removed Substances

Solids, sludges, filter backwash, or other pollutants removed from or resulting from treatment or control of wastewaters shall be disposed of in a manner such as to prevent any pollutant from such materials from entering waters of the State and to be in compliance with all Indiana statutes and regulations relative to liquid and/or solid waste disposal. The discharge of pollutants in treated wastewater is allowed in compliance with the applicable effluent limitations in Part I. of this permit.

C. REPORTING REQUIREMENTS

1. Planned Changes in Facility or Discharge

Pursuant to 327 IAC 5-2-8(10)(F), the permittee shall give notice to the Commissioner as soon as possible of any planned physical alterations or additions to the permitted facility. In this context, permitted facility refers to a point source discharge, not a wastewater treatment facility. Notice is required only when either of the following applies:

a. The alteration or addition may meet one of the criteria for determining whether the facility is a new source as defined in 327 IAC 5-1.5.

b. The alteration or addition could significantly change the nature of, or increase the quantity of, pollutants discharged. This notification

applies to pollutants that are subject neither to effluent limitations in Part I.A. nor to notification requirements in Part II.C.9. of this permit.

Following such notice, the permit may be modified to revise existing pollutant limitations and/or to specify and limit any pollutants not previously limited.

2. Monitoring Reports

Pursuant to 327 IAC 5-2-8(9) and 327 IAC 5-2-13 through 15, monitoring results shall be reported at the intervals and in the form specified in "Monitoring Reports", Part I.C.2.

3. Twenty-Four Hour Reporting Requirements

Pursuant to 327 IAC 5-2-8(10)(C), the permittee shall orally report to the Commissioner information on the following types of noncompliance within 24 hours from the time permittee becomes aware of such noncompliance. If the noncompliance meets the requirements of item b (Part II.C.3.b) or 327 IAC 2-6.1, then the report shall be made within those prescribed time frames.

a. Any unanticipated bypass which exceeds any effluent limitation in the permit;

b. Any noncompliance which may pose a significant danger to human health or the environment. Reports under this item shall be made as soon as the permittee becomes aware of the noncomplying circumstances;

c. Any upset (as defined in Part II.B.3 above) that causes an exceedance of any effluent limitation in the permit;

d. Violation of a maximum daily discharge limitation for any of the following toxic pollutants: Mercury, Cadmium, Total Chromium, Copper, Iron, Selenium, and Zinc

The permittee can make the oral reports by calling (317)232-8670 during regular business hours or by calling (317) 233-7745 ((888)233-7745 toll free in Indiana) during non-business hours. A written submission shall also be provided within 5 days of the time the permittee becomes aware of the circumstances. The written submission shall contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times, and, if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce and eliminate the noncompliance and prevent its recurrence.

The Commissioner may waive the written report on a case-by-case basis if the oral report has been received within 24 hours. Alternatively the permittee may submit a "Bypass Fax Report" or a "Noncompliance Notification Report", whichever is appropriate, to IDEM at (317) 232-8637. If a complete fax submittal is sent within 24 hours of the time that the permittee became aware of the occurrence, then the fax report will satisfy both the oral and written reporting requirements.

4. Other Noncompliance

Pursuant to 327 IAC 5-2-8(10)(D), the permittee shall report any instance of noncompliance not reported under the "Twenty-Four Hour Reporting Requirements" in Part II.C.3, or any compliance schedules at the time the pertinent Discharge Monitoring Report is submitted. The report shall contain the information specified in Part II.C.3.

5. Other Information

Pursuant to 327 IAC 5-2-8(10)(E), where the permittee becomes aware of a failure to submit any relevant facts or submitted incorrect information in a permit application or in any report, the permittee shall promptly submit such facts or corrected information to the Commissioner.

6. Signatory Requirements

Pursuant to 327 IAC 5-2-22 and 327 IAC 5-2-8(14):

a. All reports required by the permit and other information requested by the Commissioner shall be signed and certified by a person described below or by a duly authorized representative of that person:

(1) For a corporation: by a responsible corporate officer defined as a president, secretary, treasurer, any vice-president of the corporation in charge of a principal business function, or any other person who performs similar policymaking or decision making functions for the corporation or the manager of one or more manufacturing, production or operating facilities employing more than two hundred fifty (250) persons or having the gross annual sales or expenditures exceeding twenty-five million dollars ($25,000,000) (in second quarter 1980 dollars), if authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures.

(2) For a partnership or sole proprietorship: by a general partner or the proprietor, respectively; or

(3) For a Federal, State, or local government body or any agency or political subdivision thereof: by either a principal executive officer or ranking elected official.

b. A person is a duly authorized representative only if:

(1) The authorization is made in writing by a person described above.

(2) The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity, such as the position of plant manager, operator of a well or a well field, superintendent, or a position of equivalent responsibility. (A duly authorized representative may thus be either a named individual or any individual occupying a named position.); and

(3) The authorization is submitted to the Commissioner.

c. Certification. Any person signing a document identified under Part II.C.6. shall make the following certification:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

7. Availability of Reports

Except for data determined to be confidential under 327 IAC 12.1, all reports prepared in accordance with the terms of this permit shall be available for public inspection at the offices of the Indiana Department of Environmental Management and the Regional Administrator. As required by the Clean Water Act, permit applications, permits, and effluent data shall not be considered confidential.

8. Penalties for Falsification of Reports

IC 13-30 and 327 IAC 5-2-8(14) provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance, shall, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than 180 days per violation, or by both.

9. Changes in Discharge of Toxic Substances

Pursuant to 327 IAC 5-2-9, the permittee shall notify the Commissioner as soon as it knows or has reason to believe:

a. That any activity has occurred or will occur which would result in the discharge of any pollutant identified as toxic, pursuant to Section 307(a) of the Clean Water Act which is not limited in the permit, if that discharge will exceed the highest of the following "notification levels."

(1) One hundred micrograms per liter (100µg/l);

(2) Two hundred micrograms per liter (200 µg/l) for acrolein and acrylonitrile; five hundred micrograms per liter (500µg/l) for 2,4-dinitrophenol and 2-methyl-4,6-dinitophenol; and one milligram per liter (1mg/l) for antimony;

(3) Five (5) times the maximum concentration value reported for that pollutant in the permit application in accordance with 40 CFR 122.21(g)(7); or

(4) A notification level established by the Commissioner on a case-by-case basis, either at his own initiative or upon a petition by the permittee. This notification level may exceed the level specified in subdivisions (1), (2), or (3) but may not exceed the level which can be achieved by the technology-based treatment requirements applicable to the permittee under the CWA (see 327 IAC 5-5-2).

b. That any activity has occurred or will occur which would result in any discharge, on a non-routine or infrequent basis, of a toxic pollutant which is not limited in the permit, if that discharge will exceed the highest of the following "notification levels":

(1) Five hundred micrograms per liter (500 µg/l);

(2) One milligram per liter (1 mg/l) for antimony;

(3) Ten (10) times the maximum concentration value reported for that pollutant in the permit application in accordance with Sec. 122.21(g)(7).

(4) A notification level established by the Commissioner on a case-by-case basis, either at his own initiative or upon a petition by the permittee. This notification level may exceed the level specified in subdivisions (1), (2), or (3) but may not exceed the level which can be achieved by the technology-based treatment requirements applicable to the permittee under the CWA (see 327 IAC 5-5-2).

c. That it has begun or expects to begin to use or manufacture, as an intermediate or final product or byproduct, any toxic pollutant which was not reported in the permit application under 40 CFR 122.21(g)(9).

PART III

This part applies to the Legacy Station. The IGCC Station will utilize groundwater wells for intake water. The facility will retain the existing intake structure. Once start-up of the IGCC Station is complete, the permittee is prohibited from operating the Legacy Station intake structure without prior approval from IDEM.

A. Thermal Effluent Requirements

The Duke Energy Edwardsport Legacy Generating Station has a generating capacity of 160 MW.

The permittee has in the past demonstrated, in accordance with section 316(a) of the Federal Clean Water Act, that the thermal discharge of once-through cooling water from Outfall 001 had no detrimental effect on the aquatic community of the receiving stream. Therefore, the permittee was granted a variance from the thermal water quality criteria in accordance with section 316(a).

Alternate thermal permit conditions have been included in the permit pursuant to a renewal of the section 316(a) thermal variance granted on the basis of the past demonstration. In accordance with 327 IAC 5-7 and 40 CFR 125 – Subpart H, IDEM is requiring the permittee to submit a new 316(a) variance request with the renewal application for the next NPDES permit.

The discharge from Outfall 001 shall not cause the instantaneous mixed river temperature, as calculated with the mathematical model provided below, to exceed the maximum limits in the following table more than three degrees Fahrenheit (3°F) (one and seven-tenths degrees Celsius (1.7°C)) in the four (4) month period.

Table 1

| | Jun | Jul | Aug | Sep |
|---|---|---|---|---|
| °F | 90 | 90 | 90 | 90 |
| °C | 32.2 | 32.2 | 32.2 | 32.2 |

The permittee shall calculate the mixed river temperature by employing the following mathematical model:

$$T_{MR} = T_u + \frac{Q_e(T_e - T_u)}{\text{Actual River Flow}}$$

where:

$T_{MR}$ = mixed river temperature (°F)
$T_u$ = intake temperature (°F)
$T_e$ = effluent temperature (°F)
$Q_e$ = effluent flow (MGD)

Actual River Flow = one-half of the $Q_{7,10}$ low flow value of the receiving stream in MGD

The highest single calculated mixed river temperature value for each day shall be reported on the state discharge monitoring report for each day. The highest single daily value calculated as the mixed river temperature for each month shall be reported on the federal discharge monitoring report as the maximum daily temperature for that month.

B. Intake Structures

The intake structure at the facility was approved in the previous permit relating to the location, design, construction, and capacity of the cooling water intake structures to reflect the best technology available for minimizing adverse environmental impact. The 316(b) demonstration was approved by the USEPA Region 5 and IDEM on April 3, 1980. Approval of the intake structure of the Legacy Station, pursuant to section 316(b) of the Clean Water Act, is renewed for operation of the Legacy Station under this permit. See Part IV for Phase II 316(b) Intake Structure Requirements. Once start-up of the IGCC Station is complete, the permittee is prohibited from operating the Legacy Station intake structure without prior approval from IDEM.

C. Chlorine Concentration

The total exposure for Outfall 001 to Total Residual Chlorine (TRC) shall not exceed forty (40) minutes in duration and such periods shall be separated by at least five (5) hours. Simultaneous multi-unit chlorination is permitted.

D. Intake Screen Wash

The discharge of Intake Screen Backwash shall meet the Narrative Water Quality Standards contained in Part I.B. of the permit.

E. Polychlorinated Biphenyl

There shall be no discharge of polychlorinated biphenyl (PCBs) compounds such as those commonly used for transformer fluid.

# PART IV

This part applies to the Legacy Station. The IGCC Station will utilize groundwater wells for intake water. The facility will retain the existing intake structure. Once start-up of the IGCC Station is complete, the permittee is prohibited from operating the Legacy Station intake structure without prior approval from IDEM.

A. Cooling Water Intake Structure(s) Application Submittal Requirements for facilities previously recognized as Phase II Facilities

In accordance with 40 CFR 401.14, IDEM is requiring power plants previously affected by phase II of the rule (40 CFR part 125 Subpart J) to submit Source Water Physical Data, Source Waterbody Flow Information, the Impingement Mortality and/or Entrainment Characterization Study, and the Proposal for Information Collection (if not previously submitted and approved by IDEM). This information will establish baseline conditions that will be needed to implement the provisions of phase II of the rule once it has been revised by EPA. The permit contains a reopening clause that will allow IDEM to reopen the permits once the new rules for phase II have been finalized.

If not previously submitted, the permittee shall submit the information required to the Industrial NPDES Permits Section, Office of Water Quality- Mail Code 65-42, Indiana Department of Environmental Management, 100 North Senate Avenue, Indianapolis, Indiana 46204, no later than eighteen (18) months from the effective date of this permit. If notification of startup of the IGCC Station is provided to IDEM under Part I.A of this permit before the end of this eighteen month period, it shall not be necessary for the permittee to submit this information. The required information is summarized below.

1. Source Water Physical Data to include:

   a. A narrative description and scaled drawings showing the physical configuration of all source water bodies used by the facility including aerial dimensions, depths, salinity and temperature regimes;

   b. Identification and characterization of the source waterbody's hydrological and geomorphological features, as well as the methods used to conduct any physical studies to determine the intake's area of influence and the results of such studies; and

   c. Location maps.

2. Source Waterbody Flow Information

The permittee shall submit the following source waterbody flow information:

a. If the cooling water structure is located in a freshwater river or stream, provide the annual mean flow of the waterbody, any supporting documentation and engineering calculations to support the analysis of whether the design intake flow is greater than five percent of the mean annual flow of the river or stream for purposes of determining applicable performance standards. Representative historical data (from a period of time up to 10 years, if available) shall be used; and

b. If the cooling water intake structure is located in a lake (other than one of the Great Lakes or a reservoir) and the permittee propose to increase the design intake flow, the permittee shall provide a description of the thermal stratification in the waterbody, and any supporting documentation and engineering calculations to show that the total design intake flow after the increase will not disrupt the natural thermal stratification and turnover pattern in a way that adversely impacts fisheries, including the results of any consultations with Federal, State, or Tribal fish and wildlife management agencies.

3. Impingement Mortality and/or Entrainment Characterization Study

The permittee shall submit an Impingement Mortality and/or Entrainment Characterization Study whose purpose is to provide information to support the development of a calculation baseline for evaluating impingement mortality and entrainment and to characterize current impingement mortality and entrainment. The Study shall include the following in sufficient detail to support establishment of baseline conditions:

a. Taxonomic identification of all life stages of fish and shellfish and any species protected under Federal, State, or Tribal law (including threatened or endangered species) that are in the vicinity of the cooling water intake structure(s) and are susceptible to impingement and entrainment;

b. A characterization of all life stages of fish and shellfish, and any species protected under Federal, State, or Tribal law, including a description of the abundance and temporal and spatial characteristics in the vicinity of the cooling water intake structure(s). These may include historical data that are representative of the current operation of the facility and of biological conditions at the site; and

c. Documentation of the current impingement mortality and entrainment of all life stages of fish, shellfish, and any species protected under Federal , State, or Tribal Law (including threatened or endangered species) and an estimate of impingement mortality and entrainment to be used as the

calculation baseline. The documentation may include historical data that are representative of the current operation of the facility and of biological conditions at the site. Impingement mortality and entrainment samples to support the calculations required must be collected during periods of representative operational flows for the cooling water intake structure and the flows associated with the samples must be documented.

4. Proposal for Information Collection- (if not previously submitted and approved by IDEM)

The proposal for information shall be submitted prior to the start of information collection activities, but the permittee may initiate such activities prior to receiving comment from the Department. The proposal shall include:

a. A list and description of any historical studies characterizing impingement mortality and entrainment and/or the physical and biological conditions in the vicinity of the cooling water intake structures and their relevance to establishing baseline conditions. If the permittee propose to use existing data, the permittee shall demonstrate the extent to which the data are representative of current conditions and that the data were collected using appropriate quality assurance/quality control procedures;

b. A summary of any past or ongoing consultations with appropriate Federal, State, and Tribal fish and wildlife agencies that are relevant to establishing baseline conditions, and a copy of written comments received as a result of such consultations; and

c. A sampling plan for any new field studies proposed to conduct in order to ensure that the permittee has sufficient data to develop a scientifically valid estimate of impingement mortality and entrainment at the site. The sampling plan must document all methods and quality assurance/quality control procedures for sampling and data analysis. The sampling and data analysis methods you propose shall be appropriate for a quantitative survey and include consideration of the methods used in other studies performed in the source waterbody. The sampling plan shall include a description of the study area (including area of influence of the cooling water intake structure(s), and provide a taxonomic description of the sampled or evaluated biological assemblages (including all life stages of fish and shellfish).

B. Reopening Clause

This permit may be modified, or, alternately, revoked and reissued, to comply with any applicable standards, regulations and requirements issued or approved under section 316(b) of the Clean Water Act, if the standards, regulations and requirements so issued or approved contains different conditions than those in the permit.

# National Pollutant Discharge Elimination System

**FACT SHEET for**

**DUKE ENERGY INDIANA, Inc.**

**JULY 2010**

## Indiana Department of Environmental Management

100 North Senate Avenue
Indianapolis, Indiana 46204
(317) 232-8603
Toll Free (800) 451-6027
www.idem.IN.gov

| | | |
|---|---|---|
| **Permittee:** | Duke Energy Indiana, Inc.<br>1000 East Main Street<br>Plainfield, IN 46168 | |
| **Existing Permit Information:** | Permit Number: IN0002780<br>Expiration Date: 10/31/10 | |
| **Source Contact:** | **Legacy Station:**<br>Larry W. Roark, Certified Operator/General Manager<br>(812)735-5444 ext. 1126 | |
| | **IGCC Station:**<br>Jack Stultz, General Manager<br>(812)735-8943 | |
| **Source Location:** | Legacy Station<br>15400 Villwock Rd.<br>Edwardsport, IN 47528<br>Knox County | IGCC Station<br>15424 East State Rd. 358<br>Edwardsport, IN 47528<br>Knox County |
| **Receiving Stream:** | The West Fork of the White River | |
| **Proposed Action:** | Renew Permit: IN0002780<br>Date Application Received: 12/23/09 | |
| **Source Category** | NPDES Major – Industrial | |
| **Permit Writer:** | Richard Hamblin<br>(317)232-8696 **rhamblin@idem.in.gov** | |

## Table of Contents

# 1.0 INTRODUCTION

The Indiana Department of Environmental Management (IDEM) received a National Pollutant Discharge Elimination System (NPDES) Permit application on December 23, 2009, from Environmental Quality Management on behalf of Duke Energy Indiana, Inc. for the Edwardsport Generating Station, herein referred to as the permittee. A five year permit is proposed in accordance with 327 IAC 5-2-6(a).

The Federal Water Pollution Control Act Amendments of 1972 and subsequent amendments (commonly referred to as the Federal Clean Water Act) require a NPDES permit for the discharge of wastewater to surface waters. Furthermore, Indiana Statute 13-15-1-2 requires a permit to control or limit the discharge of any contaminants into state waters or into a publicly owned treatment works. This proposed permit action by IDEM complies with both federal and state requirements.

In accordance with Title 40 of the Code of Federal Regulations (CFR) Sections 124.8 and 124.6, as well as Title 327 of the Indiana Administrative Code (IAC) Article 5, Rule 3, development of a Fact Sheet is required for NPDES permits. This document fulfills the requirements established in those regulations.

This Fact Sheet was prepared in order to document the factors considered in the development of NPDES Permit effluent limitations. The technical basis for the Fact Sheet may consist of evaluations of promulgated effluent guidelines, existing effluent quality, receiving water conditions, and wasteload allocations to meet Indiana Water Quality Standards. Decisions to award variances to Water Quality Standards or promulgated effluent guidelines are justified in the Fact Sheet where necessary.

# 2.0 FACILITY DESCRIPTION

## 2.1 General

The permittee is classified under Standard Industrial Classification (SIC) Code 4911- Electric Power Services. The facility is a coal-fired electric generating station, herein referred to as the **Legacy Station**, capable of generating approximately 160MW of electricity. Duke Energy has entered into an expansion project that will result in the replacement of the Legacy Station with a 618MW Integrated Gasification Combined Cycle Generating Station, herein referred to as the **IGCC Station**. The application submitted is for renewal of the NPDES permit for the Legacy Station and the operation of the IGCC Station once it becomes operational. Operation of the existing Legacy Station will be permanently terminated prior to initial startup of the new emissions units at the IGCC Station. Both of these events are anticipated to be completed in mid-2011.

The IGCC station represents a major advance in demonstrated clean coal technology. Gasification, in general, is a process in which coal is converted to hydrogen and carbon monoxide (syngas) and used as fuel instead of conventional pulverized coal. The gasification process removes any impurities in the coal that would otherwise be released in a conventional coal combustion plant. The IGCC station's state-of-the-art design will allow the use of higher sulfur coals, such as those characteristically found in Indiana, without the use of flue gas desulfurization techniques and the high volume of solid waste. Instead, the sulfur removed from the coal in the gasification process is expected to be 99% pure and will be handled as a commodity by the permittee. All regulated air pollutants will be emitted at lower rates per unit of electrical power generated compared to the Legacy Station. In addition to using syngas as

the main fuel source for making steam, the IGCC Station will capture radiant heat from the gasification process to produce additional steam for electric generation.

A map showing the location of the facility has been included as Figure 1.

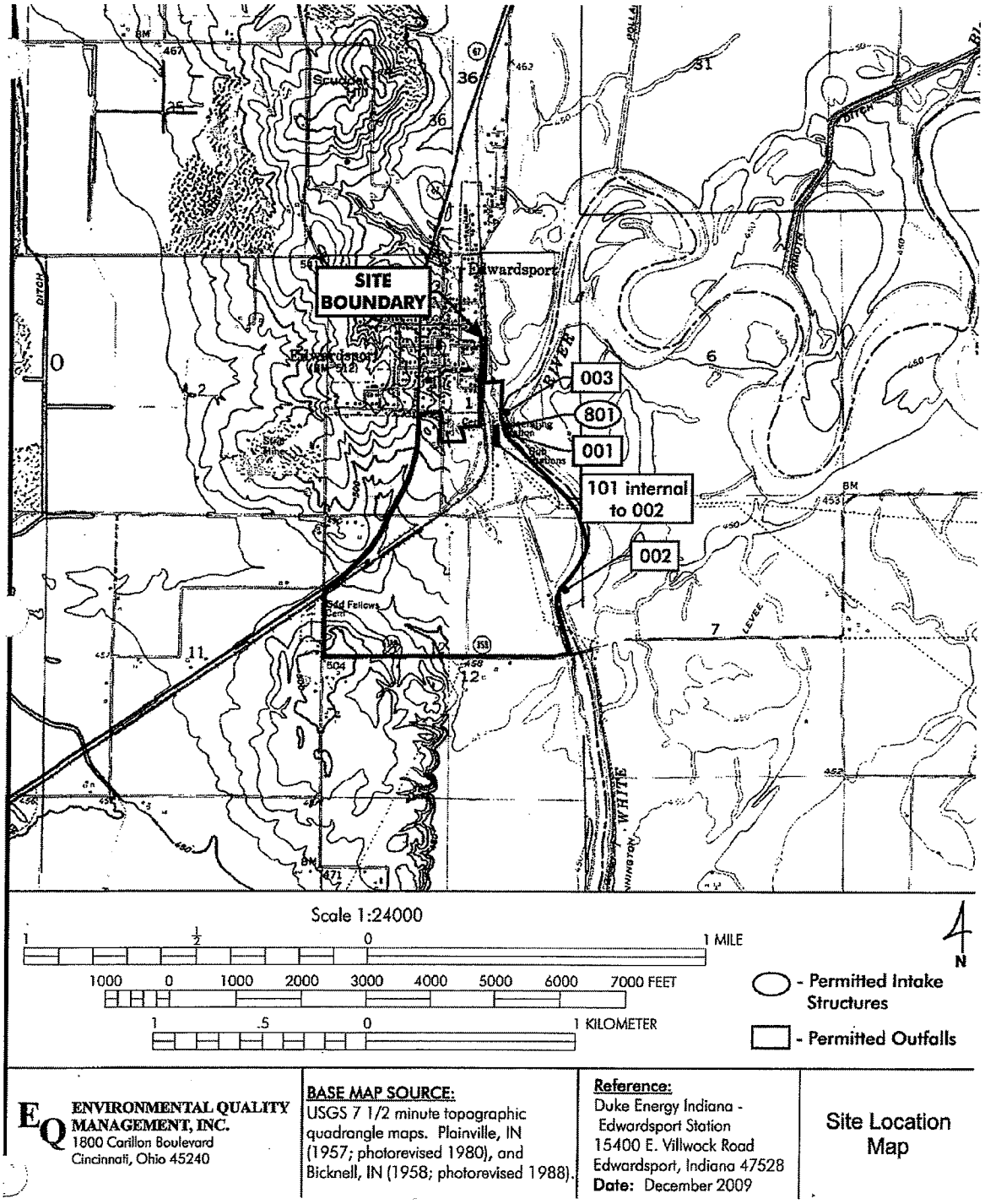


**Figure 1: Facility Location**

KNOX COUNTY

## 2.2 Outfall Locations

| | | |
|---|---|---|
| OUTFALL 001 | Latitude: | 38° 48' 22" |
| | Longitude: | 87° 14' 46" |
| OUTFALL 002 | Latitude: | 38° 47' 50" |
| | Longitude: | 87° 14' 32" |
| OUTFALL 003 | Latitude: | 38° 48' 25" |
| | Longitude: | 87° 14' 47" |
| OUTFALL 004 | Latitude: | 38° 47' 41" |
| | Longitude: | 87° 15' 2" |
| OUTFALL 005 | Latitude: | 38° 48' 7" |
| | Longitude: | 87° 14' 45" |

## 2.3 Wastewater Treatment

Legacy Station

The Legacy Station discharge consists of three (3) outfalls and one internal outfall: Outfalls 001, 002, 003, and 101, respectively. The discharge from Outfall 001(188.6MGD) consists of strainer backwash water (1.2MGD), intake screen backwash (0.2MGD), and once through condenser cooling water (187.2MGD). Outfall 001 collects in a discharge tunnel and is directed to the West Fork of the White River.

The discharge from Outfall 002 (18.8MGD) consists of ash sluice water (3.8MGD), storm water (1.3MGD), and wastewater from the Wet/Dry Pit (9.82MGD). The Wet/Dry Pit collects regenerate wastewater (0.04MGD), softener blowdown (0.2MGD), bearing cooling water (2.9MGD), oil cooling water (0.07MGD), filter backwash (0.58MGD), clarifier blowdown (0.2MGD), strainer backwash (0.2MGD), coal pile runoff (0.01MGD), hydrogen cooler water (0.7MGD), air cooler water (1.4MGD), oil cooler condensate (3.5MGD), as well as boiler blowdown via Internal Outfall 101 (0.02MGD).

Outfall 003 consists of storm water runoff from the North Parking Lot area.

Intake water is collected from the West Fork of the White River via permitted intake structure 801.

The permittee shall have the wastewater treatment facilities under the responsible charge of an operator certified by the Commissioner in a classification corresponding to the classification of the wastewater treatment plant as required by IC 13-18-11-11 and 327 IAC 5-22-5. In order to operate a wastewater treatment plant the operator shall have qualifications as established in 327 IAC 5-22-7. The IDEM OWQ Compliance Branch has given the permittee a Class A-SO industrial wastewater treatment plant classification for the Legacy Station.

A Flow Diagram for the Legacy Station has been included as Figure 2.

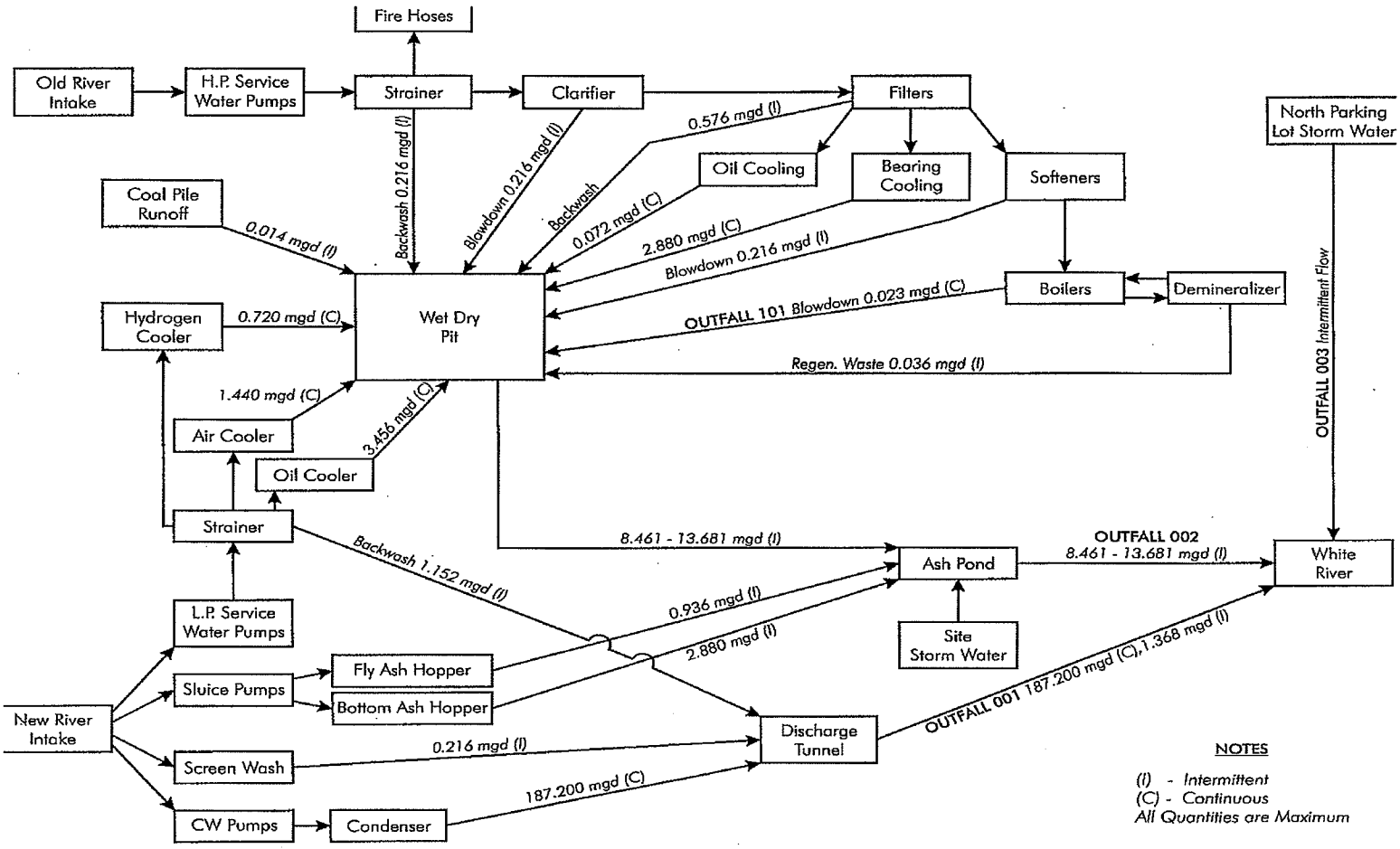


**Figure 2: Legacy Station Flow Diagram**

## IGCC Station

The IGCC Station discharge will consist of four (4) final outfalls and four (4) internal outfalls: existing Oufalls 002 and 003; Internal Outfalls 201, 301, 401, and 501; and new Outfalls 004 and 005. Outfall 001 will not be used for the IGCC Station and will be decommissioned as part of the IGCC startup. The discharge of Outfall 002 (3.9MGD) from the final settling pond will consist of coal pile runoff (0.03MGD), coal pile runoff pond effluent (0.07MGD), and Southeast Pond effluent (3.8MGD). The Southeast Pond collects site storm water (0.2MGD avg. event), treated sanitary effluent (0.003MGD), oil/water separator water (0.1MGD), cooling tower blowdown (1.6MGD), gasification and power block quenches and drains (0.29MGD), softener and filter regenerant (0.8MGD), and 'grey-water' treatment flows (0.9MGD). The grey water treatment system removes dissolved and suspended solids from the gasification process water. As part of the grey water system, the solids are dewatered. Water produced from the dewatering process is recycled back to the system and/or gasification system. A Flow Diagram for the IGCC Station has been included as Figure 3.

The Southeast Pond has an Off Spec retention basin to store wastewater from any process upsets that may occur and threaten to cause the facility to exceed the final effluent limits. This Off Spec Pond is an HPDE lined pond with approximately 1 million gallons of capacity. It is a contingency plan for such things as spills, equipment malfunctions, operational errors, additional storm water storage, etc. and gives the facility an opportunity to provide the necessary treatment for unpredictable events prior to being pumped back to the Southeast Pond. Normal operation of the Off Spec Pond will keep it as empty as possible.

Internal outfalls have been established to better characterize the wastestreams from various sources. For example, Internal Outfall 201 has been established to monitor sanitary effluent; Internal Outfall 301 has been established to better characterize up-sets sent to the Off Spec Pond; Internal Outfall 401 has been established to monitor any emergency overflows from the Southeast Pond; and Internal Outfall 501 has been established to better characterize the grey water treatment capabilities.

Outfall 003 will continue to consist of storm water runoff from the North Parking Lot area and discharge to the West Fork of the White River. In addition, newly constructed Outfalls 004 and 005 will also convey storm water. Outfall 004 discharges to an un-named tributary to the White River located in an existing storm water channel under State Road 358 along the southern boundary of the IGCC Station. Outfall 004 also contains a potential to discharge an emergency overflow from the Southeast Pond. Whole Effluent Toxicity Testing requirements have been incorporated into this permit at Internal Outfall 401 to monitor any such emergency discharge. Outfall 005 is located in the drainage channel between the settling ponds and the IGCC Station operational area and discharges to an unnamed wetland adjacent to an unnamed tributary of the West Fork of the White River.

Intake water is collected from two (2) groundwater collection wells. Intake Structure 801 will remain in place in the event that additional make-up water is needed. The facility is required to notify IDEM prior to use of the Intake Structure 801 after completion of the IGCC Station.

The permittee shall have the wastewater treatment facilities under the responsible charge of an operator certified by the Commissioner in a classification corresponding to the classification of the wastewater treatment plant as required by IC 13-18-11-11 and 327 IAC 5-22-5. In order to operate a wastewater treatment plant the operator shall have qualifications as established in 327 IAC 5-22-7. The IDEM OWQ Compliance Branch has given the permittee a Class D industrial wastewater treatment plant classification for the IGCC Station.

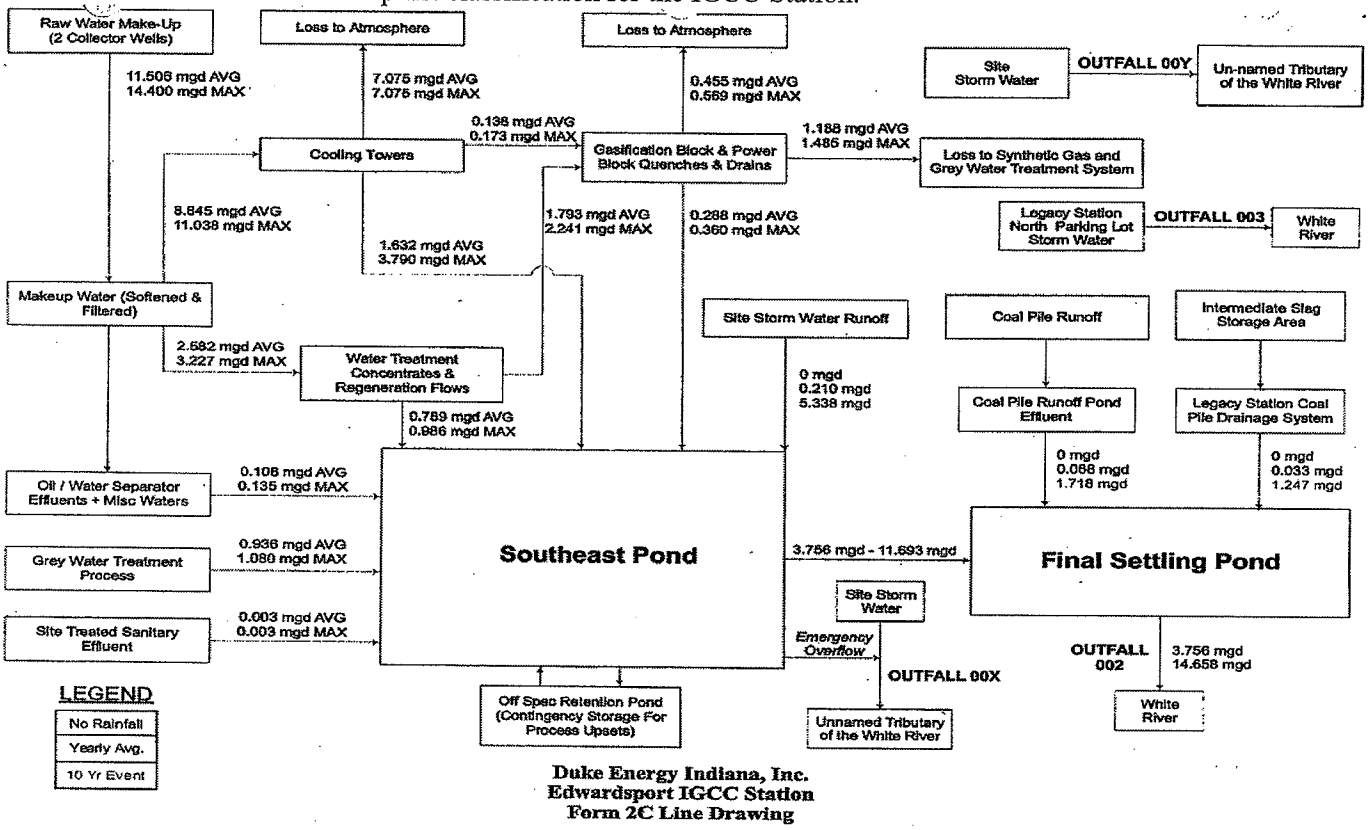


**Figure 3: IGCC Station Flow Diagram**

## 2.4 Changes in Operation

As noted under 'Facility Description', the permittee is constructing a new IGCC station. Start-up of that facility is expected in mid-2011.

## 2.5 Facility Storm Water

For the Legacy Station, an amount of contaminated storm water from the coal storage, combustion waste storage, and other process areas is collected in the Wet/Dry Pit and Ash Pond. Additional storm water from the north parking lot area, including a supply unloading area and a parts storage area, is discharged via Outfall 003. Transformer tanks in this area have containment measures in place to prevent contamination.

For the IGCC Station, Outfall 003 will carry storm water from the same sources. Newly constructed Outfall 004 will drain the western portion of the facility and contain runoff from paved and gravel parking areas and roadways for coal trucks. Chemical storage tanks and transformers in this area have been placed in secondary containment structures to prevent contamination of storm water. Treated water from the coal pile runoff will be collected by perimeter drains and routed to the coal pile runoff treatment pond. Coal that is stored for future use will be shaped and compacted to minimize the effects from weather.

A newly constructed Outfall 005 will drain the eastern portion of the IGCC operational area and contain runoff from a vegetated area and a limited amount of station roadways to the east of the coal handling area.

Slag is a by-product of reaction between coal and oxygen in the presence of heat, primarily compromised of coal constituents that will not volatilize under such conditions. Slag from the gasifier is in a molten liquid phase. Upon reaching the radiant syngas cooler, the slag cools into a largely inert, vitrified material with some amount of un-reacted carbon on its surface. Once cooled, the slag is grinded and washed. The resulting fine slag will be re-introduced into the gasification process to recover the remaining carbon. Coarse slag with less un-reacted carbon will be transported to the short term storage bins. These storage bins consist of a concrete floor and weather cover. Storm water from this area is directed to the coal pile runoff pond prior to discharging via Outfall 002.

Grey water system solids are handled in a covered building, thus not exposed to storm water. In addition, elemental sulfur is a by-product of the coal gasification process and handling of sulfur will not be exposed to storm water.

# 3.0 COMPLIANCE HISTORY

A review of the computerized database for tracking compliance found no violations for the past three (3) years.

# 4.0 RECEIVING WATER

The receiving stream for Outfalls 001, 002, and 003 is the West Fork of the White River. The West Fork of the White River has a $Q_{7,10}$ low flow value at river mile 113, as determined by the USGS, of 398 cfs and shall be capable of supporting a well balanced warm water aquatic community and full body contact recreation in accordance with 327 IAC 2-1-3.

The receiving stream for Outfall 004 is an unnamed tributary to the West Fork of the White River. The receiving stream for Outfall 005 is an unnamed wetland that discharges to the unnamed tributary of the West Fork of the White River. The $Q_{7,10}$ low flow value of the unnamed tributary and unnamed wetland is considered 0.0 cfs and shall be capable of

supporting a well balanced warm water aquatic community and full body contact recreation in accordance with 327 IAC 2-1-3. A Site Map has been included as Figure 4.

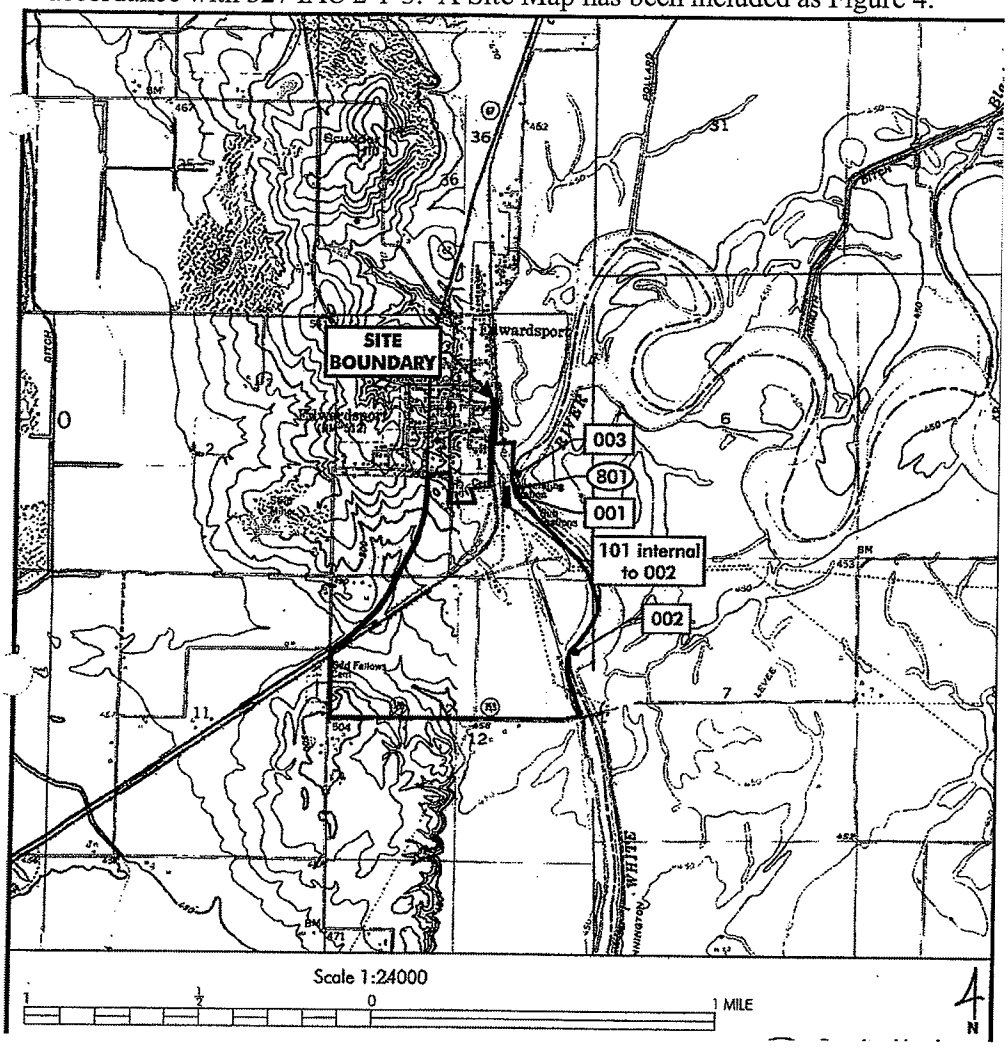


**Figure 4: Site Map**

## 4.1 Receiving Stream Water Quality

The West Fork of the White River is on the 2008 303(d) List of Impaired Waters for PCB's and mercury content in fish tissue. Total Maximum Daily Load (TMDL) projects have been completed for various portions of the White River for E. coli. However, a TMDL project has not been drafted for this section of the receiving stream. The unnamed tributary and unnamed wetland to the West Fork of the White river is not on the 2008 303(d) List of Impaired Waters.

# 5.0 PERMIT LIMITATIONS

Two categories of effluent limitations exist for NPDES permits: 1) Technology based effluent limits, and 2) Water quality based effluent limits.

Technology based effluent limits are developed by applying the national effluent limitation guidelines (ELGs) established by EPA for specific industrial categories. Technology based effluent limits were established to require a minimum level of treatment for industrial or municipal sources using available technology. In the absence of federally promulgated guidelines effluent limits can also be based upon Best Professional Judgment (BPJ). Technology based limits are the primary mechanism of control and enforcement of water

pollution under the CWA. Technology based treatment requirements under section 301(b) of the CWA represent the minimum level of control that must be imposed in a section 402 permit [40 CFR 125.3(a)]. Accordingly, every individual member of a discharge class or category is required to operate their water pollution control technologies according to industry-wide standards and accepted engineering practices. This means that technology-based effluent limits based upon a BPJ determination are applied at end-of-pipe and mixing zones are not allowed [40 CFR 125.3(a)]. Similarly, since the statutory deadlines for BPT, BAT and BCT have all passed, compliance schedules are also not allowed.

Water quality based effluent limits are designed to be protective of the beneficial uses of the receiving water and are independent of the available treatment technology. In addition, when performing a permit renewal, there are existing permit limits that must be considered under anti-backsliding rules. These may be technology-based limits or water quality-based limits. When renewing a permit, the more stringent of technology based or water quality based limits apply.

According to 40 CFR 122.44 and 327 IAC 5, NPDES permit limits are based on either technology-based limitations or Indiana Water Quality-Based Effluent Limitations (WQBEL's), whichever are more stringent. The decision to limit or monitor the parameters contained in this permit is based on information contained in the permittee's NPDES application.

The water quality-based effluent limitations for this facility are based on water quality criteria contained in 327 IAC 2-1-6 or developed under the procedures described in 327 IAC 2-1-8.2 through 327 IAC 2-1-8.6 and implementation procedures in 327 IAC 5. Limitations and/or monitoring are required for parameters identified by applications of the reasonable potential to exceed WQBEL under 327 IAC 5-2-11.1 (h)(1).

- Narrative Water Quality Based Limits

  The narrative water quality based limits have been included in this permit to ensure that the narrative water quality criteria contained under 327 IAC 2-1-6(a)(1) (A)-(E) are met.

- Numeric Water Quality Based Limits

  The numeric water quality based limits contained in this permit have been calculated using the tables of water quality criteria under 327 IAC 2-1-6(b) & (c).

## 5.1 Existing Permit Limits

Outfall 001

| Parameter | Monthly Average | Daily Maximum | Units |
|---|---|---|---|
| Flow | Report | Report | MGD |
| Upstream Flow | Report | Report | MGD |
| Total Residual Chlorine<br>Continuous<br>Intermittent | <br>0.016<br>N/A | <br>0.038<br>0.2 | <br>mg/l<br>mg/l |
| Total Residual Oxidants | N/A | 0.06 | mg/l |
| Chlorination/Bromination Frequency | N/A | Report | Time/Day |
| Chlorination/Bromination Duration | N/A | Report | Minutes |
| Temperature<br>Intake<br>Effluent | <br>N/A<br>N/A | <br>Report<br>Report | <br>°F<br>°F |

| | | | |
|---|---|---|---|
| Mixed River Temperature | N/A | Report | °F |

| Parameter | Daily Minimum | Daily Maximum | Units |
|---|---|---|---|
| pH | 6.0 | 9.0 | Std Units |

Outfall 002

| Parameter | Monthly Average | Daily Maximum | Units |
|---|---|---|---|
| Flow | Report | Report | MGD |
| Total Suspended Solids | 30 | 100 | mg/l |
| Oil & Grease | 15 | 20 | mg/l |
| Copper | N/A | 0.2 | mg/l |
| Iron | N/A | 1.0 | mg/l |
| Arsenic | Report | Report | mg/l |
| Cadmium | Report | Report | mg/l |
| Selenium | Report | Report | mg/l |
| Nickel | Report | Report | mg/l |
| Aluminum | Report | Report | mg/l |
| Silver | Report | Report | mg/l |
| Zinc | Report | Report | mg/l |
| Free Cyanide | Report | Report | mg/l |
| Sulfate | Report | Report | mg/l |
| Mercury | N/A | Report | ng/l |

| Parameter | Daily Minimum | Daily Maximum | Units |
|---|---|---|---|
| pH | Report | Report | Std Units |

Outfall 003

| Parameter | Monthly Average | Daily Maximum | Units |
|---|---|---|---|
| Flow | N/A | Report | MGD |
| Total Suspended Solids | N/A | Report | mg/l |
| Oil & Grease | N/A | Report | mg/l |
| COD | N/A | Report | mg/l |

| Parameter | Daily Minimum | Daily Maximum | Units |
|---|---|---|---|
| pH | 6.0 | 9.0 | Std Units |

Internal Outfall 101

| Parameter | Monthly Average | Daily Maximum | Units |
|---|---|---|---|
| Flow | Report | Report | MGD |
| Total Suspended Solids | 30 | 100 | mg/l |
| Oil & Grease | 15 | 20 | mg/l |

| Parameter | Daily Minimum | Daily Maximum | Units |
|---|---|---|---|
| pH | 6.0 | 9.0 | Std Units |

## 5.2 Technology-Based Effluent Limits

The USEPA has established technology-based effluent guidelines for steam electric generating facilities in 40 CFR Part 423.

Legacy Station

Since the Legacy Station is an existing facility, all discharges may be subject to effluent guidelines identified in 40 CFR 423.12, Best Practicable Control Technology (BPT) and/or 40 CFR 423.13, Best Available Control Technology (BAT). The following tables provide a summary of the applicable regulations.

| | **Monthly Average Limits** | | | | |
|---|---|---|---|---|---|
| **40 CFR 423.12 BPT** | **ELGs** | | | | |
| | **TSS** | **O+G** | **Cu** | **Fe** | **Cl** |
| | **mg/l** | **mg/l** | **mg/l** | **mg/l** | **mg/l** |
| Low Volume Waste | 30.0 | 15.0 | --- | --- | --- |
| Fly Ash & Bottom Ash Transport Water | 30.0 | 15.0 | --- | --- | --- |
| Metal Cleaning Wastes | 30.0 | 15.0 | 1.0 | 1.0 | --- |
| Once Thru Cooling Water | --- | --- | --- | --- | 0.2* |
| Coal Pile Runoff | --- | --- | --- | --- | --- |
| | **Daily Maximum Limits** | | | | |
| **40 CFR 423.12 BPT** | **ELGs** | | | | |
| | **TSS** | **O+G** | **Cu** | **Fe** | **Cl** |
| | **mg/l** | **mg/l** | **mg/l** | **mg/l** | **mg/l** |
| Low Volume Waste | 100 | 20.0 | --- | --- | --- |
| Fly Ash & Bottom Ash Transport Water | 100 | 20.0 | --- | --- | --- |
| Metal Cleaning Wastes | 100 | 20.0 | 1.0 | 1.0 | --- |
| Once Thru Cooling Water | --- | --- | --- | --- | 0.5* |
| Coal Pile Runoff | 50 | --- | --- | --- | --- |

* Denotes Free Available Chlorine

| **Monthly Average Limits** | | | |
|---|---|---|---|
| **40 CFR 423.13 BAT** | **ELGs** | | |
| | **Cu** | **Fe** | **Cl** |
| | **mg/l** | **mg/l** | **mg/l** |
| Metal Cleaning Wastes | 1.0 | 1.0 | --- |
| **Daily Maximum Limits** | | | |
| **40 CFR 423.13 BAT** | **ELGs** | | |
| | **Cu** | **Fe** | **Cl** |
| | **mg/l** | **mg/l** | **mg/l** |
| Once Thru Cooling Water | --- | --- | 0.2** |
| Metal Cleaning Wastes | 1.0 | 1.0 | --- |

** Denotes Total Residual Chlorine

In addition, the following stipulations are found in 40 CFR 423.12 and 40 CFR 423.13:

- The pH of all discharges, except once through cooling water, shall be within the range of 6.0–9.0.

- There shall be no discharge of polychlorinated biphenyl compounds such as those commonly used for transformer fluid.
- Neither free available chlorine nor total residual chlorine may be discharged from any unit for more than two hours in any one day and not more than one unit in any plant may discharge free available or total residual chlorine at any one time unless the utility can demonstrate to the Regional Administrator or State, if the State has NPDES permit issuing authority, that the units in a particular location cannot operate at or below this level of chlorination.
- In the event that waste streams from various sources are combined for treatment or discharge, the quantity of each pollutant or pollutant property controlled in paragraphs (b)(1) through (11) of this section attributable to each controlled waste source shall not exceed the specified limitations for that waste source.

Technology-based effluent limits are included for the following:

- Oil & Grease, Total Suspended Solids, and Iron
  Oil & Grease, TSS, and Iron limitations are included in the permit pursuant 40 CFR 423.12.

IGCC Station

Since the IGCC Station is a newly constructed facility, all discharges may be subject to effluent guidelines identified in 40 CFR 423.15, New Source Performance Standards. The following table provides a summary of the applicable regulations.

| | **Monthly Average Limits** | | | | | | |
|---|---|---|---|---|---|---|---|
| **40 CFR 423.15 NSPS** | **ELGs** | | | | | | |
| | **TSS** | **O+G** | **Cu** | **Fe** | **Cl** | **Cr** | **Zn** |
| | **mg/l** | **mg/l** | **mg/l** | **mg/l** | **mg/l** | **mg/l** | **mg/l** |
| Low Volume Waste | 30.0 | 15.0 | --- | --- | --- | --- | --- |
| Fly Ash & Bottom Ash Transport Water | Not Applicable for this Facility | | | | | | |
| Metal Cleaning Wastes | 30.0 | 15.0 | 1.0 | 1.0 | --- | --- | --- |
| Cooling Tower Blowdown | --- | --- | --- | --- | 0.2** | 0.2 | 1.0 |
| | **Daily Maximum Limits** | | | | | | |
| **40 CFR 423.15 NSPS** | **ELGs** | | | | | | |
| | **TSS** | **O+G** | **Cu** | **Fe** | **Cl** | **Cr** | **Zn** |
| | **mg/l** | **mg/l** | **mg/l** | **mg/l** | **mg/l** | **mg/l** | **mg/l** |
| Low Volume Waste | 100 | 20.0 | --- | --- | --- | --- | --- |
| Fly Ash & Bottom Ash Transport Water | Not Applicable for this Facility | | | | | | |
| Metal Cleaning Wastes | 100 | 20.0 | 1.0 | 1.0 | --- | --- | --- |
| Once Thru Cooling Water | Not Applicable for this Facility | | | | | | |
| Cooling Tower Blowdown | --- | --- | --- | --- | 0.5** | 0.2 | 1.0 |
| Coal Pile Runoff | 50.0 | --- | --- | --- | --- | --- | --- |

** Denotes Free Available Chlorine

In addition, the following stipulations are found in 40 CFR 423.15:

- The pH of all discharges, except once through cooling water, shall be within the range of 6.0–9.0.

- There shall be no discharge of polychlorinated biphenyl compounds such as those commonly used for transformer fluid.
- Neither free available chlorine nor total residual chlorine may be discharged from any unit for more than two hours in any one day and not more than one unit in any plant may discharge free available or total residual chlorine at any one time unless the utility can demonstrate to the Regional Administrator or State, if the State has NPDES permit issuing authority, that the units in a particular location cannot operate at or below this level or chlorination.
- In the event that waste streams from various sources are combined for treatment or discharge, the quantity of each pollutant or pollutant property controlled in paragraphs (a) through (m) of this section attributable to each controlled waste source shall not exceed the specified limitations for that waste source.
- There shall be no detectable amount of the 126 priority pollutants (Appendix A of this part) contained in chemicals added for cooling tower maintenance except Total Chromium and Total Zinc. Compliance with the limitations for the 126 priority pollutants may be determined by engineering calculations which demonstrate that the regulated pollutants are not detectable in the final discharge by the analytical methods in 40 CFR part 136.

The IGCC Station will also include a sanitary wetland for the treatment of sanitary effluent from the facility. Therefore, technology based effluent limits for Small Sanitary Dischargers found in 327 IAC 5-10-5 apply. The following table provides a summary of the applicable regulations.

| | **Daily Maximum Limits** | |
|---|---|---|
| **Small Sanitary Discharger 327 IAC 5-10-5** | **TSS** | **$CBOD_5$** |
| | **mg/l** | **mg/l** |
| | 30 | 25 |

In accordance with 40 CFR 125.45(h), limits on internal wastestreams will be imposed in cases where the wastestreams, at the point of combined discharge, are so diluted that it would make detection or analysis of a specific wastestream impracticable. Therefore an internal outfall with limits are established in the IGCC Station portion of this permit for the Small Sanitary Discharger Rule identified above.

Technology-based effluent limits are included for the following:

- Total Suspended Solids, Oil & Grease, and $CBOD_5$
  Since the wastestreams are combined for treatment/discharge pursuant to 40 CFR 423.15(n), the Total Suspended Solids and Oil and Grease limits will apply at Outfall 002. Limitations for Total Suspended Solids and $CBOD_5$ are also included at Internal Outfall 201 in accordance with 327 IAC 5-10-5.

- Total Chromium and Iron
  Total Chromium and Iron limitations are included in accordance with 40 CFR 423.15. Since the wastestreams are combined for treatment/discharge pursuant to 40 CFR 423.15(n), the limits will apply at Outfall 002.

## 5.3 Water Quality-Based Effluent Limits

The water quality-based effluent limits were calculated using the criteria contained in Table 1 of 327 IAC 2-1-6, Minimum Surface Water Quality Standards, and the procedure contained in 327 IAC 5-2-11.1, Establishment of Water Quality-Based Effluent Limitations for Dischargers not discharging to Waters within the Great Lakes System. A copy of the Waste Load Allocation Report is included in Appendix A of the Fact Sheet.

Legacy Station

- Flow

The permittee's flow is to be monitored in accordance with 327 IAC 5-2-13(a)2.

- pH

Discharges to waters of the state are limited to the range of 6.0-9.0 s.u., in accordance with 327 IAC 2-1-6.

- Effluent Temperature

Effluent Limitations for temperature are based on 327 IAC 2-1-6(b). The permit requires effluent temperature monitoring frequency to be monitored once per hour and the sample type designated as 'continuous' with the highest temperature recorded for the day entered on the Discharge Monitoring Reports (DMRs) for the four (4) compliance months of June, July, August, and September. During non-compliance months, the facility shall record temperature readings once every eight (8) hours and report the highest reading of the day on the DMRs. The monitoring will correlate with the intake temperature monitoring.

- Intake Temperature

The permit requires intake temperature monitoring frequency to be monitoring once per hour and the sample type designated as 'continuous'. The monitoring will correlate with the effluent temperature monitoring.

- Mixed River Temperature

The permittee shall calculate the mixed river temperature by employing the mathematical model in Part III.B of the permit.

- Total Residual Chlorine – Continuous

The existing TRC limits of 0.016 mg/l monthly average and 0.038 mg/l daily maximum are carried over from the previous permit. The limitations are based on 327 IAC 2-1-6. Continuous chlorination is considered all occurrences that do not meet the definition of intermittent chlorination, as described in 327 IAC 2-1-6 Table 1.

- Total Residual Chlorine – Intermittent

The existing TRC limit of 0.2 mg/l daily maximum is carried over from the previous permit. The limitations are based on 327 IAC 2-1-6. To qualify for the intermittent discharge limitation, the total exposure at Outfall 001 for TRC shall not be exceeded by forty (40) minutes in duration and such periods shall be separated by at least five (5) hours. Simultaneous multi-unit chlorination is permitted. The permittee should refer to 'Chlorination Frequency' and 'Chlorination time period per dose (duration)' for additional requirements.

- Chlorination/Bromination Frequency

The monitoring for chlorination frequency applies only when the facility is chlorinating intermittently. The permit requires the permittee to provide a monthly report on the "times, and day" the permittee is intermittently chlorinating. The permittee is limited to no more than four (4) chlorination cycles per day.

- Chlorination/Bromination Time Period per Dose (Duration)

The monitoring for time period per chlorination/bromination dose (duration) applies only when the facility is chlorinating/brominating intermittently. The permit requires the permittee to provide a monthly report on the number of minutes per chlorination/bromination cycle the permittee in intermittently chlorinating. The permittee is limited to no more than forty (40) minutes per chlorination/bromination cycles.

- Total Residual Oxidants

The monitoring requirement and effluent limitation for Total Residual Oxidants (TRO) will apply at any time chlorine or bromine are used and may be in the discharge. The same test methods to measure for Total Residual Chlorine are used to determine the level of Total Residual Oxidants. At present, two test methods are considered to be acceptable to IDEM, amperometric (EPA Method 330.1, 4500-Cl-D,E) and DPD colorimetric methods (EPA Method 330.5,

4500-Cl-G), to determine TRO concentrations at the level of 0.06 mg/l. If another EPA test method is to be used, the method must first be approved by this Agency.

- Copper

The Copper limit for daily maximum in the permit is more stringent than the effluent limit guidelines in 40 CFR 423.12. Therefore, in accordance with anti-backsliding requirements set forth in 327 IAC 5-2-10(11), the limits shall remain in the permit.

- Aluminum, Nickel, Silver, Zinc, Cadmium, Selenium, Sulfate, Arsenic, and Cyanide

These pollutants were included in the permit due to the fact that they may be present in the discharge in quantities that have the reasonable potential to exceed Indiana Water Quality Standards. These pollutants were taken from 327 IAC 15-7-7 and the US Department of the Interiors publication dated September 1980 "*Handling of Combustion and Emission Abatement Wastes from Coal-Fired Power Plants: Implications for Fish and Wildlife Resources*".

- Mercury

New mercury analytical and sampling methodology provide for limits of detection and quantification at levels below the water quality criterion, and the IDEM is requiring major NPDES dischargers to utilize these methodologies to determine if their discharges have reasonable potential to exceed the water quality criterion.

The NPDES permit requires that mercury sampling be conducted bi-monthly in the months of February, April, June, August, October, and December of each year for the term of the permit. This shall be achieved by either installing appropriate analytical facilities or by obtaining the services of a commercial laboratory.

The permittee may submit a request for review of monitoring data after the first year of sampling has been completed using EPA Test Method 1631, Method E. The permit may be modified to reduce monitoring requirements for mercury if it is found that it will not be discharged at a level that will cause, have the reasonable potential to cause, or contribute to an excursion (RPE) above a water quality criteria. If RPE does not exist, any reduction of monitoring will remain in effect only during the term of the renewal of the permit and as long as there are no modifications to the wastewater treatment facilities and/or significant changes to the influent flow characteristics of the wastewater treatment facility. This requirement has been carried over from the previous permit to now determine if that potential exists

IGCC Station

- Flow

The permittee's flow is to be monitored in accordance with 327 IAC 5-2-13(a)2.

- pH

Discharges to waters of the state are limited to the range of 6.0-9.0 s.u., in accordance with 327 IAC 2-1-6.

- Temperature

Monitoring requirements for Temperature are included in the permit to determine if there is a reasonable potential to exceed the Water Quality Criteria. Effluent limits have not been included due to the retention time provided by the treatment system (approximately 34 days). However, the narrative language has been included to ensure that the receiving stream is not impacted by an overall increase in stream temperature of five (5) degrees Fahrenheit in accordance with 327 IAC 2-1-6(b)(4).

- Aluminum, Antimony, Barium, Manganese, Phenol, Total Cyanide, Fluoride, Sulfate (as $SO_4$), Sulfide (as S), Arsenic III, Beryllium, Free Cyanide, Lead, Nickel, Silver, Thallium, and Chloride

These parameters are being included in this permit because they have been identified in the permittee's application as being present in the discharge. Monitoring requirements have been included to determine if the discharge has the reasonable potential to exceed Indiana Water Quality criteria.

- Cadmium, Ammonia (as N), and Selenium

Effluent limitations for these parameters have been calculated in a Waste Load Allocation report, WLA001761 dated March 24, 2010, and apply at Outfall 002. These parameters have been identified in the permittee's application as 'believed present'. The calculated limits are given below:

| Parameter | Monthly Average | Daily Maximum | Units |
|---|---|---|---|
| Ammonia (as N) | 12 | 24 | mg/l |
| Cadmium | 0.011 | 0.022 | mg/l |
| Selenium | 0.13 | 0.26 | mg/l |

- Total Residual Chlorine, Copper, and Zinc

The TRC, copper, and zinc Water Quality Based Effluent Limitations are more stringent than the categorical limitations for these parameters found in 40 CFR 423.15. Therefore, the more stringent limitations apply at Outfall 002.

- Mercury

New mercury analytical and sampling methodology provide for limits of detection and quantification at levels below the water quality criterion, and the IDEM is requiring major NPDES dischargers to utilize these methodologies to determine if their discharges have reasonable potential to exceed the water quality criterion.

The NPDES permit requires that mercury sampling be conducted bi-monthly in the months of February, April, June, August, October, and December of each year for the term of the permit. This shall be achieved by either installing appropriate analytical facilities or by obtaining the services of a commercial laboratory.

The permittee may submit a request for review of monitoring data after the first year of sampling has been completed using EPA Test Method 1631, Method E. The permit may be modified to reduce monitoring requirements for mercury if it is found that it will not be discharged at a level that will cause, have the reasonable potential to cause, or contribute to an excursion (RPE) above a water quality criteria. If RPE does not exist, any reduction of monitoring will remain in effect only during the term of the renewal of the permit and as long as there are no modifications to the wastewater treatment facilities and/or significant changes to the influent flow characteristics of the wastewater treatment facility. This requirement has been carried over from the previous permit to now determine if that potential exists in regards to the added wastestream of leachate. Mercury limitations are included in this permit because coal pile run-off at other facilities have been found to contain mercury.

## 5.4 Whole Effluent Toxicity

The Indiana Water Quality Standards require that a discharge shall not cause acute toxicity, as measured by Whole Effluent Toxicity Tests (WETT), at any point in the water body and that a discharge shall not cause chronic toxicity, as measured by whole effluent toxicity tests, outside of the applicable mixing zone. Per Indiana Rule 327 IAC 5-2-11 .5(c)(2), the commissioner

may include, in the NPDES permit, WETT requirements to generate the data needed to adequately characterized the toxicity of the effluent to aquatic life. Therefore WETT requirements have been included for Outfall 002 and Internal Outfall 401.

The permittee is required to conduct WETT to determine the toxicity of the water treatment additives and process wastestreams that may be used at this site. This does not negate the necessity to submit Water Treatment Additive (WTA) approval worksheets for the additives proposed at this site.

## 5.5 Antibacksliding

None of the limits included in this permit conflict with antibacksliding regulations found in 327 IAC 5-2-10(11).

## 5.6 Stormwater

According to 40 CFR 122.26(b)(14)(ii) and 327 IAC 5-4-6(b)(1) facilities classified under Industrial Classification (SIC) Code 4911 – Electric Services, are considered to be engaging in "industrial activity" for purposes of 40 CFR 122.26(b). Therefore the permittee is required to have all storm water discharges associated with industrial activity permitted. Treatment for storm water discharges associated with industrial activities is required to meet, at a minimum, best available technology economically achievable/best conventional pollutant control technology (BAT/BCT) requirements. EPA has determined that non-numeric technology-based effluent limits have been determined to be equal to BPT/BAT/BCT for storm water associated with industrial activity.

Storm water associated with industrial activity must be assessed to determine compliance with all water quality standards. The non-numeric storm water conditions and effluent limits contain the technology-based effluent limitations. Effluent limitations, as defined in the CWA, are restrictions on quantities, rates, and concentrations of constituents which are discharged. Effective implementation of these requirements should meet the applicable water quality based effluent limitations. Violation of any of these effluent limitations constitutes a violation of the permit.

The technology-based effluent limitations require the permittee to minimize exposure of raw, final, or waste materials to rain, snow, snowmelt, and runoff. In doing so, the permittee is required, to the extent technologically available and economically practicable and achievable, to either locate industrial materials and activities inside or to protect them with storm resistant coverings. In addition, the permittee is required to: (1) use good housekeeping practices to keep exposed areas clean, (2) regularly inspect, test, maintain and repair all industrial equipment and systems to avoid situations that may result in leaks, spills, and other releases of pollutants in stormwater discharges, (3) minimize the potential for leaks, spills and other releases that may be exposed to stormwater and develop plans for effective response to such spills if or when they occur, (4) stabilize exposed area and contain runoff using structural and/or non-structural control measures to minimize onsite erosion and sedimentation, and the resulting discharge of pollutants, (5) divert, infiltrate, reuse, contain or otherwise reduce stormwater runoff, to minimize pollutants in your discharges, (6) enclose or cover storage piles of salt or piles containing salt used for deicing or other commercial or industrial purposes, including maintenance of paved surfaces, (7) train all employees who work in areas where industrial materials or activities are exposed to stormwater, or who are responsible for implementing activities necessary to meet the conditions of this permit (e.g., inspectors, maintenance personnel), including all members of your Pollution Prevention Team, (8) ensure that waste, garbage and floatable debris are not discharged to receiving waters by keeping exposed areas free of such materials or by intercepting them before they are discharged, and (9) minimize generation of dust and off-site tracking of raw, final or waste materials.

To meet the non-numeric effluent limitations in Part I.D.4, the permit requires Duke Energy to select control measures (including best management practices) to address the selection and design considerations in Part I.D.3.

The permittee must control its discharge as necessary to meet applicable water quality standards. It is expected that compliance with the non-numeric effluent limitations and other terms and conditions in this permit will meet this effluent limitation. However, if at any time the permittee, or IDEM, determines that the discharge causes or contributes to an exceedance of applicable water quality standards, the permittee must take corrective actions, and conduct follow-up monitoring.

**"Term and Condition" to Provide Information in a SWPPP**

Distinct from the effluent limitation provisions in the permit, the permit requires the discharger to prepare a Stormwater Pollution Prevention Plan (SWPPP) for its facility. The SWPPP is intended to document the selection, design, installation, and implementation (including inspection, maintenance, monitoring, and corrective action) of control measures being used to comply with the effluent limits set forth in Part I.D. of the permit. In general, the SWPPP must be kept up-to-date, and modified whenever necessary to reflect any changes in control measures that were found to be necessary to meet the effluent limitations in this permit.

The requirement to prepare a SWPPP is not an effluent limitation, rather it documents what practices the discharger is implementing to meet the effluent limitations in Part I.D. of the permit. The SWPPP is not an effluent limitation because it does not restrict quantities, rates, and concentrations of constituents which are discharged. Instead, the requirement to develop a SWPPP is a permit "term or condition" authorized under sections 402(a)(2) and 308 of the Act. Section 402(a)(2) states, "[t]he Administrator shall prescribe conditions for [NPDES] permits to assure compliance with the requirements of paragraph (1) of this subsection, including conditions on data and information collection, reporting, and such other requirements as he deems appropriate." The SWPPP requirements set forth in this permit are terms or conditions under the CWA because the discharger is documenting information on how it intends to comply with the effluent limitations (and inspection and evaluation requirements) contained elsewhere in the permit. Thus, the requirement to develop a SWPPP and keep it updated is no different than other information collection conditions, as authorized by section 402(a)(2), in other permits.

IDEM's Non-Numeric Effluent Limitations and SWPPP language was modeled from and is consistent with the EPA's Multi-Sector General Permit for Storm Water Discharges Associated with Industrial Activity, issued on September 29, 2008. It should be noted that EPA has developed a guidance document, "Storm Water Management for Industrial Activities: Developing Pollution Prevention Plans and Best Management Practices", 1992 to assist facilities in developing a SWPPP. The guidance contains worksheets, checklists, and model forms that should assist a facility in developing a SWPPP.

## 5.7 Water Treatment Additives

In the event that changes are to be made in the use of water treatment additives including dosage rates and concentrations contributing to Outfall 001, the permittee shall notify the Indiana Department of Environmental Management as required by Part II.C. 1. of this permit. The permittee must provide the acute and chronic aquatic toxicity information on any new or changed water treatment additives. The following water treatment additives have been approved for use: Sodium Hypochlorite, caustic soda (sodium hydroxide), Nalco 1250, Nalco BT-4000, Nalco SL-395, soda ash (sodium carbonate), hydrated lime, Ferralyte 8131, Core Shell 71325, sulfuric acid, Permatreat PC-191T, ControlBrom CB70, Nalco 1336, and 3D TRASAR 3DT187.

## 5.8 Antidegradation

The permittee has submitted an antidegradation demonstration as part of their NPDES permit application in accordance with 327 IAC 2-1-2. The demonstration is included as Appendix B of this Fact Sheet. In the demonstration, the facility identifies each wastewater component for the discharge, lists treatment methodologies for each, and provides analysis for alternative or enhanced treatment techniques and cost association for each. Furthermore, the demonstration identifies the potential impacts and the economic and social importance of the discharge. This agency has reviewed the demonstration and determined that it is sufficient to proceed with Public Notice of the Draft Permit.

# 6.0 PERMIT DRAFT DISCUSSION

## 6.1 Legacy Station Discharge Limitations

Outfall 001

| Parameter | Monthly Average | Daily Maximum | Units |
|---|---|---|---|
| Flow | Report | Report | MGD |
| Upstream Flow | Report | Report | MGD |
| Total Residual Chlorine<br>Continuous<br>Intermittent | <br>0.016<br>N/A | <br>0.038<br>0.2 | <br>mg/l<br>mg/l |
| Total Residual Oxidants | N/A | 0.06 | mg/l |
| Chlorination/Bromination Frequency | N/A | Report | Time/Day |
| Chlorination/Bromination Duration | N/A | Report | Minutes |
| Temperature<br>Intake<br>Effluent | <br>N/A<br>N/A | <br>Report<br>Report | <br>°F<br>°F |
| Mixed River Temperature | N/A | Report | °F |

| Parameter | Daily Minimum | Daily Maximum | Units |
|---|---|---|---|
| pH | 6.0 | 9.0 | Std Units |

Outfall 002

| Parameter | Monthly Average | Daily Maximum | Units |
|---|---|---|---|
| Flow | Report | Report | MGD |
| Total Suspended Solids | 30 | 100 | mg/l |
| Oil & Grease | 15 | 20 | mg/l |
| Copper | N/A | 0.2 | mg/l |
| Iron | N/A | 1.0 | mg/l |
| Arsenic | Report | Report | mg/l |
| Cadmium | Report | Report | mg/l |
| Selenium | Report | Report | mg/l |
| Nickel | Report | Report | mg/l |
| Aluminum | Report | Report | mg/l |
| Silver | Report | Report | mg/l |
| Zinc | Report | Report | mg/l |
| Free Cyanide | Report | Report | mg/l |
| Sulfate | Report | Report | mg/l |
| Mercury | N/A | Report | ng/l |

| Parameter | Daily Minimum | Daily Maximum | Units |
|---|---|---|---|
| pH | 6.0 | 9.0 | Std Units |

Outfall 003

| Parameter | Monthly Average | Daily Maximum | Units |
|---|---|---|---|
| Flow | N/A | Report | MGD |
| Total Suspended Solids | N/A | Report | mg/l |
| Oil & Grease | N/A | Report | mg/l |
| COD | N/A | Report | mg/l |
| pH | N/A | Report | Std Units |

Internal Outfall 101

| Parameter | Monthly Average | Daily Maximum | Units |
|---|---|---|---|
| Flow | N/A | Report | MGD |
| Total Suspended Solids | 30 | 100 | mg/l |
| Oil & Grease | 15 | 20 | mg/l |

| Parameter | Daily Minimum | Daily Maximum | Units |
|---|---|---|---|
| pH | 6.0 | 9.0 | Std Units |

## 6.2 Legacy Station Monitoring Conditions and Rationale

Outfall 001

| Parameter | Minimum Frequency | Type of Sample |
|---|---|---|
| Flow | Daily | 24-hour total |
| Upstream Flow | Daily | Gauge |
| Total Residual Chlorine<br>Continuous<br>Intermittent | <br>2/Week<br>1/Day | <br>Grab<br>Grab |
| Total Residual Oxidants | 1/Day | Grab |
| Chlorination/Bromination Frequency | 1/Month | Report |
| Chlorination/Bromination Duration | 1/Month | Report |
| Temperature<br>Intake<br>Effluent | <br>Daily<br>Daily | <br>Continuous<br>Continuous |
| Mixed River Temperature | Daily | Calculated |

Outfall 002

| Parameter | Minimum Frequency | Type of Sample |
|---|---|---|
| Flow | Daily | Continuous |
| Total Suspended Solids | 1/Week | Grab |
| Oil & Grease | 1/Week | Grab |
| Copper | 1/Day | 8-hour composite |
| Iron | 1/Day | 8-hour composite |
| Arsenic | 2/Month | 8-hour composite |
| Cadmium | 2/Month | 8-hour composite |
| Selenium | 2/Month | 8-hour composite |
| Nickel | 2/Month | 8-hour composite |

| | | |
|---|---|---|
| Aluminum | 2/Month | 8-hour composite |
| Silver | 2/Month | 8-hour composite |
| Zinc | 2/Month | 8-hour composite |
| Free Cyanide | 2/Month | Grab |
| Sulfate | 2/Month | 8-hour composite |
| Mercury | Bi-Monthly | Grab |
| pH | 1/Week | Grab |

Outfall 003

| Parameter | Minimum Frequency | Type of Sample |
|---|---|---|
| Flow | 1/Yearly | Estimate Total |
| Total Suspended Solids | 1/Yearly | Grab |
| Oil & Grease | 1/Yearly | Grab |
| COD | 1/Yearly | Grab |
| pH | 1/Yearly | Grab |

Internal Outfall 101

| Parameter | Minimum Frequency | Type of Sample |
|---|---|---|
| Flow | 1/Quarter | 24-hour total |
| Total Suspended Solids | 1/Quarter | Grab |
| Oil & Grease | 1/Quarter | Grab |
| pH | 1/Quarter | Grab |

## 6.3 IGCC Station Discharge Limitations

Outfall 002

| Parameter | Monthly Average | Daily Maximum | Units |
|---|---|---|---|
| Flow | Report | Report | MGD |
| Total Suspended Solids | 30 | 100 | mg/l |
| Oil & Grease | 15 | 20 | mg/l |
| Temperature | Report | Report | °F |
| Total Residual Chlorine | 0.02 | 0.04 | mg/l |
| Copper | 0.042 | 0.084 | mg/l |
| Iron | 1.0 | 1.0 | mg/l |
| Arsenic | Report | Report | mg/l |
| Cadmium | 0.011 | 0.022 | mg/l |
| Selenium | 0.13 | 0.26 | mg/l |
| Nickel | Report | Report | mg/l |
| Aluminum | Report | Report | mg/l |
| Beryllium | Report | Report | mg/l |
| Silver | Report | Report | mg/l |
| Zinc | 0.25 | 0.51 | mg/l |
| Free Cyanide | Report | Report | mg/l |
| Total Cyanide | Report | Report | mg/l |
| Sulfate (as SO4) | Report | Report | mg/l |
| Sulfide (as S) | Report | Report | mg/l |
| Mercury | 12 | 20 | ng/l |
| Chloride | Report | Report | mg/l |
| Lead | Report | Report | mg/l |
| Total Chromium | 0.2 | 0.2 | mg/l |
| Thallium | Report | Report | mg/l |

| | | | |
|---|---|---|---|
| Ammonia (as N) | 12 | 24 | mg/l |
| Fluoride | Report | Report | mg/l |
| Antimony | Report | Report | mg/l |
| Barium | Report | Report | mg/l |
| Manganese | Report | Report | mg/l |
| Phenol | Report | Report | mg/l |
| Whole Effluent Toxicity Testing | | | |

| Parameter | Daily Minimum | Daily Maximum | Units |
|---|---|---|---|
| pH | 6.0 | 9.0 | Std Units |

Outfalls 003, 004, & 005

| Parameter | Monthly Average | Daily Maximum | Units |
|---|---|---|---|
| Flow | N/A | Report | MGD |
| Total Suspended Solids | N/A | Report | mg/l |
| Oil & Grease | N/A | Report | mg/l |
| COD | N/A | Report | mg/l |
| pH | N/A | Report | mg/l |
| $CBOD_5$ | N/A | Report | mg/l |
| Total Kjeldahl Nitrogen | N/A | Report | mg/l |
| Nitrate plus Nitrite Nitrogen | N/A | Report | mg/l |
| Total Phosphorus | N/A | Report | mg/l |

Internal Outfall 201 – Treated Sanitary Wastewater Effluent

| Parameter | Monthly Average | Daily Maximum | Units |
|---|---|---|---|
| Flow | Report | Report | MGD |
| Total Suspended Solids | N/A | 30 | mg/l |
| $CBOD_5$ | N/A | 25 | mg/l |

Internal Outfall 301 – Wastestreams Entering Off Spec Pond

| Parameter | Monthly Average | Daily Maximum | Units |
|---|---|---|---|
| Flow | Report | Report | MGD |
| Total Suspended Solids | Report | Report | mg/l |
| Oil & Grease | Report | Report | mg/l |
| Total Residual Chlorine | Report | Report | mg/l |
| Copper | Report | Report | mg/l |
| Iron | Report | Report | mg/l |
| Arsenic | Report | Report | mg/l |
| Cadmium | Report | Report | mg/l |
| Selenium | Report | Report | mg/l |
| Nickel | Report | Report | mg/l |
| Aluminum | Report | Report | mg/l |
| Beryllium | Report | Report | mg/l |
| Silver | Report | Report | mg/l |
| Zinc | Report | Report | mg/l |
| Free Cyanide | Report | Report | mg/l |
| Total Cyanide | Report | Report | mg/l |
| Sulfate (as SO4) | Report | Report | mg/l |
| Sulfide (as S) | Report | Report | mg/l |
| Mercury | Report | Report | ng/l |
| Chloride | Report | Report | mg/l |

| | | | |
|---|---|---|---|
| Lead | Report | Report | mg/l |
| Total Chromium | Report | Report | mg/l |
| Thallium | Report | Report | mg/l |
| Ammonia (as N) | Report | Report | mg/l |
| Fluoride | Report | Report | mg/l |
| Antimony | Report | Report | mg/l |
| Barium | Report | Report | mg/l |
| Manganese | Report | Report | mg/l |
| Phenol | Report | Report | mg/l |

| Parameter | Daily Minimum | Daily Maximum | Units |
|---|---|---|---|
| pH | Report | Report | Std Units |

Internal Outfall 401 – Emergency Overflow

| Parameter | Monthly Average | Daily Maximum | Units |
|---|---|---|---|
| Flow | Report | Report | MGD |
| Whole Effluent Toxicity Testing | | | |

| Parameter | Daily Minimum | Daily Maximum | Units |
|---|---|---|---|
| pH | 6.0 | 9.0 | Std Units |

Internal Outfall 501 – Grey Water Treatment Effluent

| Parameter | Monthly Average | Daily Maximum | Units |
|---|---|---|---|
| Flow | Report | Report | MGD |
| Total Suspended Solids | Report | Report | mg/l |
| Oil & Grease | Report | Report | mg/l |
| Copper | Report | Report | mg/l |
| Iron | Report | Report | mg/l |
| Arsenic | Report | Report | mg/l |
| Cadmium | Report | Report | mg/l |
| Selenium | Report | Report | mg/l |
| Nickel | Report | Report | mg/l |
| Aluminum | Report | Report | mg/l |
| Beryllium | Report | Report | mg/l |
| Silver | Report | Report | mg/l |
| Zinc | Report | Report | mg/l |
| Free Cyanide | Report | Report | mg/l |
| Total Cyanide | Report | Report | mg/l |
| Sulfate (as SO4) | Report | Report | mg/l |
| Sulfide (as S) | Report | Report | mg/l |
| Mercury | Report | Report | ng/l |
| Chloride | Report | Report | mg/l |
| Lead | Report | Report | mg/l |
| Total Chromium | Report | Report | mg/l |
| Thallium | Report | Report | mg/l |
| Ammonia (as N) | Report | Report | mg/l |
| Fluoride | Report | Report | mg/l |
| Antimony | Report | Report | mg/l |
| Barium | Report | Report | mg/l |
| Manganese | Report | Report | mg/l |
| Phenol | Report | Report | mg/l |

| Parameter | Daily Minimum | Daily Maximum | Units |
|---|---|---|---|
| pH | Report | Report | Std Units |

## 6.4 IGCC Station Monitoring Conditions and Rationale

Outfall 002

| Parameter | Minimum Frequency | Type of Sample |
|---|---|---|
| Flow | Daily | Continuous |
| Total Suspended Solids | 2/Week | Grab |
| Oil & Grease | 2/Week | Grab |
| Temperature | 1/Week | Grab |
| Total Residual Chlorine | 2/Week | Grab |
| Copper | 2/Week | 24-hour composite |
| Iron | 2/Week | 24-hour composite |
| Arsenic | 1/Week | 24-hour composite |
| Cadmium | 1/Week | 24-hour composite |
| Selenium | 1/Week | 24-hour composite |
| Nickel | 1/Week | 24-hour composite |
| Aluminum | 1/Week | 24-hour composite |
| Beryllium | 1/Week | 24-hour composite |
| Silver | 1/Week | 24-hour composite |
| Zinc | 2/Week | 24-hour composite |
| Free Cyanide | 1/Week | Grab |
| Total Cyanide | 1/Week | Grab |
| Sulfate (as SO4) | 1/Week | 24-hour composite |
| Sulfide (as S) | 1/Week | Grab |
| Mercury | Bi-Monthly | Grab |
| Chloride | 1/Week | 24-hour composite |
| Lead | 1/Week | 24-hour composite |
| Total Chromium | 2/Week | 24-hour composite |
| Thallium | 1/Week | 24-hour composite |
| Ammonia (as N) | 1/Week | 24-hour composite |
| Fluoride | 1/Week | 24-hour composite |
| Antimony | 1/Week | 24-hour composite |
| Barium | 1/Week | 24-hour composite |
| Manganese | 1/Week | 24-hour composite |
| Phenol | 1/Week | Grab |
| pH | 2/Week | Grab |
| Whole Effluent Toxicity Testing | See Part I.F of permit | Report |

Outfalls 003, 004, & 005

| Parameter | Minimum Frequency | Type of Sample |
|---|---|---|
| Flow | 1/Quarter | Estimate Total |
| Total Suspended Solids | 1/Quarter | Grab |
| Oil & Grease | 1/Quarter | Grab |
| COD | 1/Quarter | Grab |
| pH | 1/Quarter | Grab |
| $CBOD_5$ | 1/Quarter | Grab |
| Total Kjeldahl Nitrogen | 1/Quarter | Grab |
| Nitrate plus Nitrite Nitrogen | 1/Quarter | Grab |
| Total Phosphorus | 1/Quarter | Grab |

Internal Outfall 201

| Parameter | Minimum Frequency | Type of Sample |
|---|---|---|
| Flow | 2/Week | Estimate Total |
| Total Suspended Solids | 2/Week | Grab |
| $CBOD_5$ | 2/Week | Grab |

Internal Outfall 301

| Parameter | Minimum Frequency* | Type of Sample |
|---|---|---|
| Flow | Daily | Estimate Total |
| Total Suspended Solids | Daily | Grab |
| Oil & Grease | Daily | Grab |
| Total Residual Chlorine | Daily | Grab |
| Copper | Daily | 24-hour composite |
| Iron | Daily | 24-hour composite |
| Arsenic | Daily | 24-hour composite |
| Cadmium | Daily | 24-hour composite |
| Selenium | Daily | 24-hour composite |
| Nickel | Daily | 24-hour composite |
| Aluminum | Daily | 24-hour composite |
| Beryllium | Daily | 24-hour composite |
| Silver | Daily | 24-hour composite |
| Zinc | Daily | 24-hour composite |
| Free Cyanide | Daily | Grab |
| Total Cyanide | Daily | Grab |
| Sulfate (as SO4) | Daily | 24-hour composite |
| Sulfide (as S) | Daily | Grab |
| Mercury | Daily | Grab |
| Chloride | Daily | 24-hour composite |
| Lead | Daily | 24-hour composite |
| Total Chromium | Daily | 24-hour composite |
| Thallium | Daily | 24-hour composite |
| Ammonia (as N) | Daily | 24-hour composite |
| Fluoride | Daily | 24-hour composite |
| Antimony | Daily | 24-hour composite |
| Barium | Daily | 24-hour composite |
| Manganese | Daily | 24-hour composite |
| Phenol | Daily | Grab |
| pH | Daily | Grab |

*The monitoring frequency for Internal Outfall 301 is 'Daily'. This is to ensure that samples are taken to characterize the waste since this wastestream is not expected to be a typical discharge. During periods of no discharge, the permittee will indicate as such on their Discharge Monitoring Reports.

Internal Outfall 401

| Parameter | Minimum Frequency* | Type of Sample |
|---|---|---|
| Flow | Daily | Estimate Total |
| Whole Effluent Toxicity Testing | Daily | Report |

*The monitoring frequency for Internal Outfall 401 is 'Daily'. This is to ensure that samples are taken to characterize the waste since this wastestream is not expected to be a typical discharge. During periods of

no discharge, the permittee will indicate as such on their Discharge Monitoring Reports.

Internal Outfall 501

| Parameter | Minimum Frequency | Type of Sample |
|---|---|---|
| Flow | 2/Month | Estimate Total |
| Total Suspended Solids | 2/Month | Grab |
| Oil & Grease | 2/Month | Grab |
| Copper | 2/Month | 24-hour composite |
| Iron | 2/Month | 24-hour composite |
| Arsenic | 2/Month | 24-hour composite |
| Cadmium | 2/Month | 24-hour composite |
| Selenium | 2/Month | 24-hour composite |
| Nickel | 2/Month | 24-hour composite |
| Aluminum | 2/Month | 24-hour composite |
| Beryllium | 2/Month | 24-hour composite |
| Silver | 2/Month | 24-hour composite |
| Zinc | 2/Month | 24-hour composite |
| Free Cyanide | 2/Month | Grab |
| Total Cyanide | 2/Month | Grab |
| Sulfate (as SO4) | 2/Month | 24-hour composite |
| Sulfide (as S) | 2/Month | Grab |
| Mercury | 2/Month | Grab |
| Chloride | 2/Month | 24-hour composite |
| Lead | 2/Month | 24-hour composite |
| Total Chromium | 2/Month | 24-hour composite |
| Thallium | 2/Month | 24-hour composite |
| Ammonia (as N) | 2/Month | 24-hour composite |
| Fluoride | 2/Month | 24-hour composite |
| Antimony | 2/Month | 24-hour composite |
| Barium | 2/Month | 24-hour composite |
| Manganese | 2/Month | 24-hour composite |
| Phenol | 2/Month | Grab |
| pH | 2/Month | Grab |

## 6.5 Schedule of Compliance

The circumstances in this NPDES permit do not qualify for a schedule of compliance.

## 6.6 Special Conditions

Section 316(a) of the Federal Clean Water Act provides variances from thermal water quality criteria. Alternate thermal permit conditions for Outfall 001 have been included in the permit renewal based on a past demonstration. In accordance with 327 IAC 5-7 and 40 CFR 125 – Subpart H, IDEM is requiring the permittee to submit a new 316(a) variance request with the renewal application for the next NPDES permit. These requirements do not apply to the IGCC Station.

In accordance with 40 CFR 401.14, IDEM is requiring power plants previously affected by phase II of the rule (40 CFR part 125 Subpart J) to submit Source Water Physical Data, Source Waterbody Flow Information, the Impingement Mortality and/or Entrainment Characterization Study, and the Proposal for Information Collection (if not previously submitted and approved by IDEM). This information will establish baseline conditions that will be needed to

implement the provisions of phase II of the rule once it has been revised by EPA. The permit contains a reopening clause that will allow IDEM to reopen the permits once the new rules for phase II have been finalized. The IGCC Station will utilize groundwater wells. However, the facility plans to retain the intake structure in case of a future need. The permittee is prohibited from operating the existing intake structure without prior approval from IDEM.

In addition, EPA Region V was conferred prior to issuing the draft permit. A 'No Objection' letter can be found in Appendix C of this Fact Sheet. This letter states that the US EPA does not have any objection to the issuance of this permit as currently written.

## 6.7 Spill Response and Reporting Requirement

Reporting requirements associated with the Spill Reporting, Containment, and Response requirements of 327 IAC 2-6.1 are included in Part II.B.2.c. and Part II.C.3. of the NPDES permit. Spills from the permitted facility meeting the definition of a spill under 327 IAC 2-6.1-4(15), the applicability requirements of 327 IAC 2-6.1-1, and the Reportable Spills requirements of 327 IAC 2-6.1-5 (other than those meeting an exclusion under 327 IAC 2-6.1-3 or the criteria outlined below) are subject to the Reporting Responsibilities of 327 IAC 2-6.1-7.

It should be noted that the reporting requirements of 327 IAC 2-6.1 do not apply to those discharges or exceedances that are under the jurisdiction of an applicable permit when the substance in question is covered by the permit and death or acute injury or illness to animals or humans does not occur. In order for a discharge or exceedance to be under the jurisdiction of this NPDES permit, the substance in question (a) must have been discharged in the normal course of operation from an outfall listed in this permit, and (b) must have been discharged from an outfall for which the permittee has authorization to discharge that substance.

## 6.8 Permit Processing/Public Comment

Pursuant to IC 13-15-5-1, IDEM will publish a general notice in the newspaper with the largest general circulation within the above county. A 30-day comment period is available in order to solicit input from interested parties, including the general public. Comments concerning the draft permit should be submitted in accordance with the procedure outlined in the enclosed public notice form.

# Appendix A

Waste Load Allocation

State Form 4336

# DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
INDIANAPOLIS

## OFFICE MEMORANDUM

Date: March 24, 2010

To: Richard Hamblin
Industrial Permits Section

Thru: John Elliott
Permits Branch

From: Gurdeo Sondhe
Permits Branch

Subject: Wasteload Allocation Report for the Duke Energy - Edwardsport Generating Station
Knox County, (IN0002780,WLA001761)

Water quality-based effluent limitations (WQBELs) for a number of pollutants were developed for the Duke Energy - Edwardsport Generating Station in Knox County for the renewal of the NPDES permit. The facility operates a 160 megawatt (MW) coal-fired electric generating station. The facility is in process of replacing this generating station with a 630 MW Integrated Gasification Combined Cycle (IGCC) generating station. The WQBELs were calculated for the discharge of process wastewater from the IGCC generating station at an average effluent flow of 3.756 mgd through Outfall 002 to the White River.

The receiving stream of the facility is White River, a tributary to the Wabash River, which has a Q7, 10 flow of 398 cfs. The White River is covered under Rule 327 IAC 2-1, and is designated for full-body contact recreation and shall be capable of supporting a well-balanced warm water aquatic community. The White River (Assessment Unit INW0272_M1036) is on the 2008 303(d) list for Mercury and PCBs in Fish Tissue. A TMDL for the White River in 14 Digit HUC (05120202070020) has not been done and no TMDL is currently in progress.

Water quality-based effluent limitations for the pollutants of concern are included in Table 1. Preliminary effluent limitations (PELs) for antimony, barium, manganese, total cyanide, fluoride and phenol are included in Table 2. The PELs for these parameters (Table 2) were calculated using screening values instead of actual water quality criteria. Therefore, they cannot be used as effluent limitations in the permit, but they could be used to screen the discharge for potential water quality impacts. The documentation of the wasteload allocation analysis is included as an attachment.

GSS/gss
Attachments

# TABLE 1
## Water Quality-based Effluent Limitations
## For Duke Energy Edwardsport Generating Station in Knox County
## Outfall 002 to the West Fork of White River
## (IN0002780, WLA001761)

| Parameter | Quality or Concentration* | | | Quantity or Loading* | | | Monthly Sampling Frequency |
|---|---|---|---|---|---|---|---|
| | Monthly Average | Daily Maximum | Units | Monthly Average | Daily Maximum | Units | |
| Arsenic III | 0.36 | 0.72 | mg/l | 11 | 23 | lbs/day | 4 |
| Beryllium | 0.15 | 0.36 | mg/l | 4.7 | 11 | lbs/day | 4 |
| Cadmium | 0.011 | 0.022 | mg/l | 0.34 | 0.69 | lbs/day | 4 |
| Total Chromium | 3.7 | 7.4 | mg/l | 120 | 230 | lbs/day | 4 |
| Copper | 0.042 | 0.084 | mg/l | 1.3 | 2.6 | lbs/day | 4 |
| Iron | 2.7 | 5.5 | mg/l | 85 | 170 | lbs/day | 4 |
| Lead | 0.25 | 0.51 | mg/l | 7.8 | 16 | lbs/day | 4 |
| Mercury | 0.000012 | 0.00002 | mg/l | 0.00038 | 0.00063 | lbs/day | 1 |
| Nickel | 3.1 | 6.2 | mg/l | 97 | 190 | lbs/day | 4 |
| Selenium | 0.13 | 0.26 | mg/l | 4.1 | 8.1 | lbs/day | 4 |
| Silver | 0.0099 | 0.02 | mg/l | 0.31 | 0.63 | lbs/day | 4 |
| Thallium | 0.086 | 0.17 | mg/l | 2.7 | 5.3 | lbs/day | 4 |
| Zinc | 0.25 | 0.51 | mg/l | 7.8 | 16 | lbs/day | 4 |
| Total Ammonia (as N) | | | | | | | |
| Summer | 12 | 24 | mg/l | 380 | 750 | lbs/day | 4 |
| Winter | 12 | 24 | mg/l | 380 | 750 | lbs/day | 4 |
| Boron | 30 | 60 | mg/l | 940 | 1900 | lbs/day | 4 |
| Chloride | 860 | 1700 | mg/l | 27000 | 53000 | lbs/day | 4 |
| Chlorine (total residual) | 0.02 | 0.04 | mg/l | 0.63 | 1.3 | lbs/day | 4 |
| Cyanide, Free | 0.022 | 0.044 | mg/l | 0.69 | 1.4 | lbs/day | 4 |
| Sulfate | 47000 | 94000 | mg/l | 1500000 | 2900000 | lbs/day | 4 |

* Based on an effluent flow of 3.756 mgd.

3/24/2010

# TABLE 2

## Preliminary Effluent Limitations Based on Screening Values*
## For Duke Energy Edwardsport Generating Station in Knox County
## Outfall 002 to the West Fork of White River
## (IN0002780, WLA001761)

| Parameter | Quality or Concentration** | | | Quantity or Loading** | | | Monthly Sampling Frequency |
|---|---|---|---|---|---|---|---|
| | Monthly Average | Daily Maximum | Units | Monthly Average | Daily Maximum | Units | |
| Antimony | 0.72 | 1.4 | mg/l | 23 | 44 | lbs/day | 4 |
| Barium | 3.3 | 6.6 | mg/l | 100 | 210 | lbs/day | 4 |
| Manganese | 2.5 | 5.1 | mg/l | 78 | 160 | lbs/day | 4 |
| Phenol | 1.3 | 2.6 | mg/l | 41 | 81 | lbs/day | 4 |
| Cyanide, Total | 1700 | 4100 | mg/l | 53000 | 130000 | lbs/day | 4 |
| Fluoride | 12 | 24 | mg/l | 380 | 750 | lbs/day | 4 |

* Preliminary effluent limitations based on screening values cannot be used as effluent limitations in NPDES permits. However, they can be used to screen discharges for monitoring purposes.

** Based on an effluent flow of 3.756 mgd.

3/24/2010

# Documentation of Wasteload Allocation Analysis
# For Discharges in the Non-Great Lakes System

**Analysis By:** Gurdeo Sondhe
**Date:** March 24, 2010

**Reviewed By:** John Elliott
**Permit Writer:** Richard Hamblin

**WLA Number:** WLA001761
**Previous WLA:** October 2006 WLA Report

**Facility Information**

- **Name:** Duke Energy - Edwardsport Generating Station
- **NPDES Permit Number:** IN0002780
- **Permit Expiration Date:** October 31, 2010
- **County:** Knox
- **Purpose of Analysis:** Calculation of WQBELs for new Integrated Gasification Combined Cycle (IGCC) Generating Station to be included in renewal of permit.

  The Duke Energy - Edwardsport Generating Station is a 165 megawatt (MW) coal fired steam electric power plant consisting of four (4) generating units with three (3) condensers, built in 1944, 1949, and 1951. All discharges are regulated under 40 CFR Part 423 - ELG for the Steam Electric Power Generating Point Source Category. This facility is classified under SIC code 4911 - Electric Power Services.

  The Duke Energy has initiated a project that will result in the replacement of the Legacy Station with a 630 MW (IGCC) Generating Station. The modification of plant will eliminate Outfall 001 (once-through non-contact cooling water) and Outfall 101, an internal (boiler blowdown) to Outfall 002. Process wastewater will continue to be discharged through Outfall 002 and storm water through Outfall 003.
- **Outfall Number:** 002 (process wastewater from the IGCC Generating Station)
- **Facility Operation:** The IGCC operation will utilize a new southeast pond which will discharge to the existing generating station final settling ponds and associated Outfall 002.

Southeast Pond Sources: receives wastewater flows from: site storm water, site treated sanitary effluent, grey water treatment process, oil/water separators, water treatment flows, cooling tower blowdown, and gasification & power block quenches and drains.

Final Settling Pond Sources: receives wastewater flows from: Legacy Generation Station Coal Pile Drainage and Coal Pile Runoff wastewater (both intermittent flows) and wastewater flow from the Southeast Pond.

- **Type of Treatment:** Final treatment in the Final Settling Pond consists of sedimentation and oil skimming prior to discharging to the White River via Outfall 002.
- **Effluent Flow for WLA Analysis:** 3.756 mgd (Average flow listed in permit application)

**Pollutants of Concern**

| Pollutants of Concern | | | | |
|---|---|---|---|---|
| **Parameters** | Type of Analysis | | | Reason for Inclusion on Pollutants of Concern List |
| | RPE | WQBEL | BOTH | |
| Antimony | | W | | Requested by the permit writer |
| Arsenic III | | W | | Requested by the permit writer |
| Barium | | W | | Requested by the permit writer |
| Beryllium | | W | | Requested by the permit writer |
| Cadmium | | W | | Requested by the permit writer |
| Chromium (Total) | | W | | Requested by the permit writer |
| Copper | | W | | Requested by the permit writer |
| Iron | | W | | Requested by the permit writer |
| Lead | | W | | Requested by the permit writer |
| Manganese | | W | | Requested by the permit writer |
| Mercury | | W | | Requested by the permit writer |
| Nickel | | W | | Requested by the permit writer |
| Selenium | | W | | Requested by the permit writer |
| Silver | | W | | Requested by the permit writer |
| Thallium | | W | | Requested by the permit writer |
| Zinc | | W | | Requested by the permit writer |
| Phenol | | W | | Requested by the permit writer |
| Total Ammonia (as N) | | W | | Requested by the permit writer |
| Boron | | W | | Requested by the permit writer |
| Chloride | | W | | Requested by the permit writer |
| Chlorine (total residual) | | W | | Requested by the permit writer |
| (free) Cyanide | | W | | Requested by the permit writer |
| (total) Cyanide | | W | | Requested by the permit writer |
| Fluoride | | W | | Requested by the permit writer |
| Sulfate | | W | | Requested by the permit writer |

**Receiving Stream Information**

- **Receiving Stream:** White River, a tributary to the Wabash River
- **Public Water System Intakes Downstream:** None
- **Designated Stream Use:** The White River is covered under Rule 327 IAC 2-1, and is designated for full-body contact recreation and shall be capable of supporting a well-balanced, warm water aquatic community.
- **14 Digit HUC:** (5120202070020) [ White River ]
- **Assessment Unit (2008) :** INW0272_M1036
- **2008 303(d) List** The White River (Assessment Unit INW0272_M1036) is on the 2008 303(d) list for Mercury and PCBs in Fish Tissue.
- **TMDL Status:** A TMDL for the White River in 14 Digit HUC (05120202070020) has not been done and no TMDL is currently in progress.
- **Q7, 10 (Outfall):** 398 cfs (Receiving Stream : WF White River)
  5012 sq.miles (Drainage Area u/s of Outfall)

  The drainage area upstream of the outfall was obtained from the book entitled Drainage Areas of Indiana Streams by Richard E. Hoggatt, published in 1975 by the USGS in cooperation with the IDNR.

  USGS Gaging Station 03360500 White River (Q7,10 = 372 cfs, Q30,10 = 414 cfs, Q50 = 2790 and Drainage Area = 4688 sq.miles) upstream of State Highway 57 at Newberry in Greene County is used for Q7,10 calculations.

  The information for the gaging station for calculating Q7, 10 of the receiving stream was obtained from the book entitled Low-Flow Characteristics of Indiana Streams by Kathleen Fowler and John T. Wilson published in 1996 by the USGS.
- **Q30, 10 (Outfall):** 443 cfs
- **Q50 (Outfall):** 2980 cfs
- **Nearby Dischargers:** None that will impact this analysis.

**Calculation of Water Quality-based Effluent Limitations**

Water quality data from fixed monitoring station: WR-134, West Fork of White River, SR 157, South of Worthington in Greene County were used for the determination of the background concentration of a given pollutant. The background concentration of each pollutant was determined by calculating the geometric mean of the instream data for the pollutant. The survey data include values reported as less than the limit of quantitation (LOQ). Those values were set equal to one-half the LOQ.

The time periods chosen for the different data sets are based on the availability of data and the desire to have data for whole years. The data sets were limited to the last five years (Year 2005 thru 2009) of available data **(Attachment 2)**. The background concentration for barium, beryllium, selenium, silver, thallium and fluoride were determined from Trace Metal Data collected at survey monitoring station : WR-Centerton, West Fork of White River at Bluff Road Bridge in the Town of Centerton in Morgan County during the period from Year 2002 through 2006. Mercury is a BCC and mixing zones for all discharges of BCCs to waters in the non-Great Lakes system are prohibited after January 1, 2004. Therefore, the criteria for mercury were applied to the undiluted discharge in accordance with 327 IAC 5-2-11.1(b) (6).

The 50th percentile downstream hardness value was used to determine the criteria for those metals whose criteria are dependent on hardness. The 50th percentile downstream hardness and chloride were used to determine the criterion for sulfate. Water quality data downstream of the facility was obtained from fixed station: WR-81, West Fork of White River, SR 358 Bridge, SE of Edwardsport in Daviess County. A 50th percentile hardness value of 251 mg/l was obtained from WQ Monitoring Station: WR-81 **(Attachment 2)**.

The 75th percentile downstream (summer/winter) pH values of 8.3/8.1 s.u. obtained from WQ Monitoring Station WR-81 and typical Southern Indiana summer/winter temperature values of 25/10°C were used in the determination of chronic ammonia-N criteria. Default (summer/winter) pH values of 7.8/7.8 s.u. were used in the determination of acute ammonia-N criteria. The summer/winter geometric mean background ammonia-N concentration values of 0.05/0.05 mg/l were used. The coefficient of variation used to calculate monthly average and daily maximum PELs was set equal to the default value of 0.6. The number of samples per month used to calculate monthly average PELs was set equal to the expected monitoring frequency. The number of samples per month for mercury was set equal to 1. The spreadsheet used to calculate PELs is included in **Attachment 3.**

ATTACHMENT 1 Outfall Location for Duke Energy - Edwardsport Generating Station


3-D TopoQuads Copyright © 1999 DeLorme Yarmouth, ME 04096 Source Data: USGS 550 ft Scale: 1 : 19,200 Detail: 13-4 Datum: WGS84

**STATION SITE SELECTED : WR-134 , W Fk White River , SR 157, S of Worthington , Greene County** **ATTACHMENT 2**

| Arsenic (Total) (ug/L) | | | | Corrected | Cadmium (Total) (ug/L) | | | | Corrected | Chloride (mg/L) | | | | Corrected |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample Date | Season | < | Lab Test | Lab Result | Sample Date | Season | < | Lab Test | Lab Result | Sample Date | Season | < | Lab Test | Lab Result |
| 1/26/2005 | | | 1.26 | 1.26 | 1/26/2005 | | L | 1 | 0.50 | 1/26/2005 | | | 50 | |
| 2/22/2005 | | | 1.29 | 1.29 | 2/22/2005 | | L | 1 | 0.50 | 2/22/2005 | | | 44 | |
| 3/31/2005 | | | 1.4 | 1.40 | 3/31/2005 | | L | 1 | 0.50 | 3/31/2005 | | | 54 | |
| 4/26/2005 | | | 2.81 | 2.81 | 4/26/2005 | | L | 1 | 0.50 | 4/26/2005 | | | 42 | |
| 5/18/2005 | | | 1.97 | 1.97 | 5/18/2005 | | L | 1 | 0.50 | 5/18/2005 | | | 45 | |
| 6/30/2005 | | | 1.99 | 1.99 | 6/30/2005 | | L | 1 | 0.50 | 6/30/2005 | | | 77 | |
| 7/26/2005 | | | 2.2 | 2.20 | 7/26/2005 | | L | 1 | 0.50 | 7/26/2005 | | | 44 | |
| 8/11/2005 | | | 2.36 | 2.36 | 8/11/2005 | | L | 1 | 0.50 | 8/11/2005 | | | 91 | |
| 9/29/2005 | | | 3.06 | 3.06 | 9/29/2005 | | L | 1 | 0.50 | 9/29/2005 | | | 38 | |
| 10/25/2005 | | | 1.46 | 1.46 | 10/25/2005 | | L | 1 | 0.50 | 10/25/2005 | | | 54 | |
| 11/17/2005 | | | 3.7 | 3.70 | 11/17/2005 | | L | 1 | 0.50 | 11/17/2005 | | | 31 | |
| 12/13/2005 | | L | 1.2 | 0.60 | 12/13/2005 | | L | 1 | 0.50 | 12/13/2005 | | | 75 | |
| 1/31/2006 | | | 1.66 | 1.66 | 1/31/2006 | | L | 1 | 0.50 | 1/31/2006 | | | 58 | |
| 2/14/2006 | | L | 1.2 | 0.60 | 2/14/2006 | | L | 1 | 0.50 | 2/14/2006 | | | 57 | |
| 3/30/2006 | | | 1.28 | 1.28 | 3/30/2006 | | L | 1 | 0.50 | 3/30/2006 | | | 46 | |
| 4/25/2006 | | | 1.94 | 1.94 | 4/25/2006 | | L | 1 | 0.50 | 4/25/2006 | | | 42 | |
| 5/18/2006 | | | 2.03 | 2.03 | 5/18/2006 | | L | 1 | 0.50 | 5/18/2006 | | | 33 | |
| 6/29/2006 | | | 2.36 | 2.36 | 6/29/2006 | | L | 1 | 0.50 | 6/29/2006 | | | 44 | |
| 7/27/2006 | | | 2.78 | 2.78 | 7/27/2006 | | L | 1 | 0.50 | 7/27/2006 | | | 58 | |
| 8/16/2006 | | | 3.07 | 3.07 | 8/16/2006 | | L | 1 | 0.50 | 8/16/2006 | | | 78 | |
| 9/19/2006 | | | 2.62 | 2.62 | 9/19/2006 | | L | 1 | 0.50 | 9/19/2006 | | | 53 | |
| 10/11/2006 | | | 2.37 | 2.37 | 10/11/2006 | | L | 1 | 0.50 | 10/11/2006 | | | 76 | |
| 11/30/2006 | | | 1.84 | 1.84 | 11/30/2006 | | L | 1 | 0.50 | 11/30/2006 | | | 46 | |
| 12/20/2006 | | | 1.36 | 1.36 | 12/20/2006 | | L | 1 | 0.50 | 12/20/2006 | | | 36 | |
| 1/31/2007 | | L | 1.2 | 0.60 | 1/31/2007 | | L | 1 | 0.50 | 1/31/2007 | | | 39 | |
| 2/28/2007 | | | 2.06 | 2.06 | 2/28/2007 | | L | 1 | 0.50 | 2/28/2007 | | | 56 | |
| 3/27/2007 | | | 3.83 | 3.83 | 3/27/2007 | | L | 1 | 0.50 | 3/27/2007 | | | 23 | |
| 4/24/2007 | | | 1.66 | 1.66 | 4/24/2007 | | L | 1 | 0.50 | 4/24/2007 | | | 40 | |
| 5/16/2007 | | | 1.85 | 1.85 | 5/16/2007 | | L | 1 | 0.50 | 5/16/2007 | | | 56 | |
| 6/28/2007 | | | 3.68 | 3.68 | 6/28/2007 | | L | 1 | 0.50 | 6/28/2007 | | | 80 | |
| 7/26/2007 | | | 3.28 | 3.28 | 7/26/2007 | | L | 1 | 0.50 | 7/26/2007 | | | 90 | |
| 8/30/2007 | | | 4.08 | 4.08 | 8/30/2007 | | L | 1 | 0.50 | 8/30/2007 | | | 96 | |
| 9/26/2007 | | | 3.71 | 3.71 | 9/26/2007 | | L | 1 | 0.50 | 9/26/2007 | | | 119 | |
| 10/22/2007 | | | 3.06 | 3.06 | 10/22/2007 | | L | 1 | 0.50 | 10/22/2007 | | | 109 | |
| 11/1/2007 | | | 2.77 | 2.77 | 11/1/2007 | | L | 1 | 0.50 | 11/1/2007 | | | 105 | |
| 12/11/2007 | | | 1.82 | 1.82 | 12/11/2007 | | L | 1 | 0.50 | 12/11/2007 | | | 100 | |
| 1/23/2008 | | | 1.72 | 1.72 | 1/23/2008 | | L | 1 | 0.50 | 1/23/2008 | | | 67 | |
| 2/25/2008 | | | 1.69 | 1.69 | 2/25/2008 | | L | 1 | 0.50 | 2/25/2008 | | | 65 | |
| 3/27/2008 | | | 3.01 | 3.01 | 3/27/2008 | | L | 1 | 0.50 | 3/27/2008 | | | 30 | |
| 4/23/2008 | | | 1.54 | 1.54 | 4/23/2008 | | L | 1 | 0.50 | 4/23/2008 | | | 45 | |
| 5/22/2008 | | | 1.65 | 1.65 | 5/22/2008 | | L | 1 | 0.50 | 5/22/2008 | | | 37 | |
| 6/23/2008 | | | 2.33 | 2.33 | 6/23/2008 | | L | 1 | 0.50 | 6/23/2008 | | | 38 | |
| 7/30/2008 | | | 2.38 | 2.38 | 7/30/2008 | | L | 1 | 0.50 | 7/30/2008 | | | 50 | |
| 8/20/2008 | | | 2.3 | 2.30 | 8/20/2008 | | L | 1 | 0.50 | 8/20/2008 | | | 48 | |
| 9/18/2008 | | | 2.65 | 2.65 | 9/18/2008 | | L | 1 | 0.50 | 9/18/2008 | | | 85 | |
| 10/15/2008 | | | 2.75 | 2.75 | 10/15/2008 | | L | 1 | 0.50 | 10/15/2008 | | | 99 | |
| 11/13/2008 | | | 1.48 | 1.48 | 11/13/2008 | | L | 1 | 0.50 | 11/13/2008 | | | 98 | |
| 12/17/2008 | | | 1.51 | 1.51 | 12/17/2008 | | L | 1 | 0.50 | 12/17/2008 | | | 90 | |
| 1/29/2009 | | | 1.34 | 1.34 | 1/29/2009 | | L | 1 | 0.50 | 1/29/2009 | | | 83 | |
| 2/23/2009 | | | 1.48 | 1.48 | 2/23/2009 | | L | 1 | 0.50 | 2/23/2009 | | | 50 | |
| 3/30/2009 | | | 1.84 | 1.84 | 3/30/2009 | | L | 1 | 0.50 | 3/30/2009 | | | 63 | |
| 4/30/2009 | | | 2.37 | 2.37 | 4/30/2009 | | L | 1 | 0.50 | 4/30/2009 | | | 28 | |
| 5/13/2009 | | | 4.42 | 4.42 | 5/13/2009 | | L | 1 | 0.50 | 5/13/2009 | | | 28 | |
| 6/29/2009 | | | 2.06 | 2.06 | 6/29/2009 | | L | 1 | 0.50 | 6/29/2009 | | | 46 | |
| 7/29/2009 | | | 2.63 | 2.63 | 7/29/2009 | | L | 1 | 0.50 | 7/29/2009 | | | 63 | |
| 8/17/2009 | | | 2.45 | 2.45 | 8/17/2009 | | L | 1 | 0.50 | 8/17/2009 | | | 72 | |
| 9/24/2009 | | | 3.24 | 3.24 | 9/24/2009 | | L | 1 | 0.50 | 9/24/2009 | | | 112 | |
| 10/26/2009 | | | 1.9 | 1.90 | 10/26/2009 | | L | 1 | 0.50 | 10/26/2009 | | | 48 | |
| 11/17/2009 | | | 1.61 | 1.61 | 11/17/2009 | | L | 1 | 0.50 | 11/17/2009 | | | 67 | |
| 12/22/2009 | | | 1.42 | 1.42 | 12/22/2009 | | L | 1 | 0.50 | 12/22/2009 | | | 45 | |

| Arsenic (Total) (ug/L) | | | Corrected | Cadmium (Total) (ug/L) | | | Corrected | Chloride (mg/L) | | | Corrected |
|---|---|---|---|---|---|---|---|---|---|---|---|
| MF For Lab Data | 0.5 | | Lab Result | MF For Lab Data | 0.5 | Lab Test | Lab Result | MF For Lab Data | | Lab Test | Lab Result |
| Samples | | | 60 | Samples | | | 60 | Samples | | 60 | |
| Minimum | | | 0.6 | Minimum | | | 0.50 | Minimum | | 23.00 | |
| Average | | | 2.2 | Average | | | 0.50 | Average | | 60.70 | |
| Maximum | | | 4.4 | Maximum | | | 0.50 | Maximum | | 119.00 | |
| STD_Deviation | | | 0.9 | STD_Deviation | | | 0.00 | STD_Deviation | | 24.14 | |
| CV | | | 0.4 | CV | | | 0.00 | CV | | 0.40 | |
| Geometeric MEAN | | | 2 | Geometeric MEAN | | | 0.5 | Geometeric MEAN | | 56 | |

**STATION SITE SELECTED : WR-134 , W Fk White River , SR 157, S of Worthington , Greene County** **ATTACHMENT 2**

| Chromium (Total) (ug/L) | | | | Corrected | Iron (Total) (ug/L) | | | | Corrected | Lead (Total) (ug/L) | | | | Corrected |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample Date | Season | < | Lab Test | Lab Result | Sample Date | Season | < | Lab Test | Lab Result | Sample Date | Season | < | Lab Test | Lab Result |
| 1/26/2005 | | | 3.01 | 3.01 | 1/26/2005 | | | 2430 | | 1/26/2005 | | | 2.13 | 2.13 |
| 2/22/2005 | | | 2.21 | 2.21 | 2/22/2005 | | | 1740 | | 2/22/2005 | | | 1.98 | 1.98 |
| 3/31/2005 | | L | 1.2 | 0.60 | 3/31/2005 | | | 760 | | 3/31/2005 | | | 1.03 | 1.03 |
| 4/26/2005 | | | 4.49 | 4.49 | 4/26/2005 | | | 3950 | | 4/26/2005 | | | 4.95 | 4.95 |
| 5/18/2005 | | | 2.23 | 2.23 | 5/18/2005 | | | 2130 | | 5/18/2005 | | | 2.28 | 2.28 |
| 6/30/2005 | | | 1.54 | 1.54 | 6/30/2005 | | | 1040 | | 6/30/2005 | | | 1.47 | 1.47 |
| 7/26/2005 | | | 2.28 | 2.28 | 7/26/2005 | | | 1940 | | 7/26/2005 | | | 2.89 | 2.89 |
| 8/11/2005 | | L | 1.2 | 0.60 | 8/11/2005 | | | 701 | | 8/11/2005 | | | 1.1 | 1.10 |
| 9/29/2005 | | | 5.2 | 5.20 | 9/29/2005 | | | 4800 | | 9/29/2005 | | | 6.48 | 6.48 |
| 10/25/2005 | | L | 1.2 | 0.60 | 10/25/2005 | | | 338 | | 10/25/2005 | | L | 1 | 0.50 |
| 11/17/2005 | | | 8.1 | 8.10 | 11/17/2005 | | | 8020 | | 11/17/2005 | | | 8.12 | 8.12 |
| 12/13/2005 | | L | 1.2 | 0.60 | 12/13/2005 | | | 414 | | 12/13/2005 | | L | 1 | 0.50 |
| 1/31/2006 | | | 3.6 | 3.60 | 1/31/2006 | | | 2720 | | 1/31/2006 | | | 3.01 | 3.01 |
| 2/14/2006 | | L | 1.2 | 0.60 | 2/14/2006 | | | 593 | | 2/14/2006 | | L | 1 | 0.50 |
| 3/30/2006 | | | 1.81 | 1.81 | 3/30/2006 | | | 1320 | | 3/30/2006 | | | 1.41 | 1.41 |
| 4/25/2006 | | | 2.56 | 2.56 | 4/25/2006 | | | 1910 | | 4/25/2006 | | | 2.29 | 2.29 |
| 5/18/2006 | | | 3.39 | 3.39 | 5/18/2006 | | | 2400 | | 5/18/2006 | | | 3.63 | 3.63 |
| 6/29/2006 | | | 3.31 | 3.31 | 6/29/2006 | | | 2430 | | 6/29/2006 | | | 3.19 | 3.19 |
| 7/27/2006 | | | 1.84 | 1.84 | 7/27/2006 | | | 1320 | | 7/27/2006 | | | 1.55 | 1.55 |
| 8/16/2006 | | | 2.49 | 2.49 | 8/16/2006 | | | 1500 | | 8/16/2006 | | | 2 | 2.00 |
| 9/19/2006 | | | 3.1 | 3.10 | 9/19/2006 | | | 2230 | | 9/19/2006 | | | 2.36 | 2.36 |
| 10/11/2006 | | | 1.89 | 1.89 | 10/11/2006 | | | 760 | | 10/11/2006 | | | 1.18 | 1.18 |
| 11/30/2006 | | | 1.9 | 1.90 | 11/30/2006 | | | 1110 | | 11/30/2006 | | | 1.38 | 1.38 |
| 12/20/2006 | | | 1.69 | 1.69 | 12/20/2006 | | | 1020 | | 12/20/2006 | | | 1.18 | 1.18 |
| 1/31/2007 | | | 1.69 | 1.69 | 1/31/2007 | | | 802 | | 1/31/2007 | | L | 1 | 0.50 |
| 2/28/2007 | | | 5.42 | 5.42 | 2/28/2007 | | | 3650 | | 2/28/2007 | | | 3.8 | 3.80 |
| 3/27/2007 | | | 10.9 | 10.90 | 3/27/2007 | | | 8140 | | 3/27/2007 | | | 9.68 | 9.68 |
| 4/24/2007 | | | 1.54 | 1.54 | 4/24/2007 | | | 981 | | 4/24/2007 | | | 1.34 | 1.34 |
| 5/16/2007 | | | 1.91 | 1.91 | 5/16/2007 | | | 1080 | | 5/16/2007 | | | 1.4 | 1.40 |
| 6/28/2007 | | | 3.74 | 3.74 | 6/28/2007 | | | 2510 | | 6/28/2007 | | | 2.96 | 2.96 |
| 7/26/2007 | | | 1.35 | 1.35 | 7/26/2007 | | | 649 | | 7/26/2007 | | | 1.03 | 1.03 |
| 8/30/2007 | | | 1.55 | 1.55 | 8/30/2007 | | | 906 | | 8/30/2007 | | | 1.3 | 1.30 |
| 9/26/2007 | | | 1.58 | 1.58 | 9/26/2007 | | | 752 | | 9/26/2007 | | | 1.17 | 1.17 |
| 10/22/2007 | | | 1.26 | 1.26 | 10/22/2007 | | | 694 | | 10/22/2007 | | L | 1 | 0.50 |
| 11/1/2007 | | | 1.67 | 1.67 | 11/1/2007 | | | 554 | | 11/1/2007 | | L | 1 | 0.50 |
| 12/11/2007 | | | 1.86 | 1.86 | 12/11/2007 | | | 1330 | | 12/11/2007 | | | 1.68 | 1.68 |
| 1/23/2008 | | L | 1.2 | 0.60 | 1/23/2008 | | | 772 | | 1/23/2008 | | L | 1 | 0.50 |
| 2/25/2008 | | | 1.68 | 1.68 | 2/25/2008 | | | 1320 | | 2/25/2008 | | | 1.41 | 1.41 |
| 3/27/2008 | | | 5.91 | 5.91 | 3/27/2008 | | | 6340 | | 3/27/2008 | | | 5.38 | 5.38 |
| 4/23/2008 | | L | 1.2 | 0.60 | 4/23/2008 | | | 832 | | 4/23/2008 | | | 1.05 | 1.05 |
| 5/22/2008 | | | 1.49 | 1.49 | 5/22/2008 | | | 1140 | | 5/22/2008 | | | 1.6 | 1.60 |
| 6/23/2008 | | | 2.65 | 2.65 | 6/23/2008 | | | 2390 | | 6/23/2008 | | | 2.5 | 2.50 |
| 7/30/2008 | | | 2.41 | 2.41 | 7/30/2008 | | | 2000 | | 7/30/2008 | | | 2.54 | 2.54 |
| 8/20/2008 | | | 1.22 | 1.22 | 8/20/2008 | | | 1090 | | 8/20/2008 | | | 1.31 | 1.31 |
| 9/18/2008 | | L | 1.2 | 0.60 | 9/18/2008 | | | 811 | | 9/18/2008 | | | 1.04 | 1.04 |
| 10/15/2008 | | L | 1.2 | 0.60 | 10/15/2008 | | | 663 | | 10/15/2008 | | | 1 | 1.00 |
| 11/13/2008 | | L | 1.2 | 0.60 | 11/13/2008 | | | 339 | | 11/13/2008 | | L | 1 | 0.50 |
| 12/17/2008 | | L | 1.2 | 0.60 | 12/17/2008 | | | 278 | | 12/17/2008 | | L | 1 | 0.50 |
| 1/29/2009 | | I | 1.20 | 0.60 | 1/29/2009 | | | 271 | | 1/29/2009 | | I | 1 | 0.50 |
| 2/23/2009 | | | 1.67 | 1.67 | 2/23/2009 | | | 1710 | | 2/23/2009 | | | 1.52 | 1.52 |
| 3/30/2009 | | | 2.6 | 2.60 | 3/30/2009 | | | 2280 | | 3/30/2009 | | | 3.07 | 3.07 |
| 4/30/2009 | | | 4.36 | 4.36 | 4/30/2009 | | | 4530 | | 4/30/2009 | | | 4.54 | 4.54 |
| 5/13/2009 | | | 10.1 | 10.10 | 5/13/2009 | | | 10900 | | 5/13/2009 | | | 11.3 | 11.30 |
| 6/29/2009 | | | 1.82 | 1.82 | 6/29/2009 | | | 1830 | | 6/29/2009 | | | 2.02 | 2.02 |
| 7/29/2009 | | I | 1.2 | 0.60 | 7/29/2009 | | | 363 | | 7/29/2009 | | I | 1 | 0.50 |
| 8/17/2009 | | I | 1.2 | 0.60 | 8/17/2009 | | | 245 | | 8/17/2009 | | I | 1 | 0.50 |
| 9/24/2009 | | | 1.23 | 1.23 | 9/24/2009 | | | 800 | | 9/24/2009 | | | 1.19 | 1.19 |
| 10/26/2009 | | | 1.61 | 1.61 | 10/26/2009 | | | 1300 | | 10/26/2009 | | | 1.48 | 1.48 |
| 11/17/2009 | | I | 1.2 | 0.60 | 11/17/2009 | | | 397 | | 11/17/2009 | | I | 1 | 0.50 |
| 12/22/2009 | | I | 1.2 | 0.60 | 12/22/2009 | | | 742 | | 12/22/2009 | | I | 1 | 0.50 |

| Chromium (Total) (ug/L) | | | Corrected | Iron (Total) (ug/L) | | | Corrected | Lead (Total) (ug/L) | | | Corrected |
|---|---|---|---|---|---|---|---|---|---|---|---|
| MF For Lab Data | 0.5 | Lab Test | Lab Result | MF For Lab Data | | Lab Test | Lab Result | MF For Lab Data | 0.5 | Lab Test | Lab Result |
| Samples | | | 60 | Samples | | 60 | | Samples | | | 60 |
| Minimum | | | 0.60 | Minimum | | 245 | | Minimum | | | 0.50 |
| Average | | | 2.32 | Average | | 1883 | | Average | | | 2.17 |
| Maximum | | | 10.90 | Maximum | | 10900 | | Maximum | | | 11.30 |
| STD_Deviation | | | 2.15 | STD_Deviation | | 2060 | | STD_Deviation | | | 2.19 |
| CV | | | 0.93 | CV | | 1.09 | | CV | | | 1.01 |
| Geometeric MEAN | | | 1.7 | Geometeric MEAN | | 1260 | | Geometeric MEAN | | | 1.5 |

**STATION SITE SELECTED : WR-134 , W Fk White River , SR 157, S of Worthington , Greene County** **ATTACHMENT 2**

| Nickel (Total) (ug/L) | | | | Corrected | Nitrogen, Ammonia (mg/L) | | | | Corrected | Zinc (Total) (ug/L) | | | | Corrected |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample Date | Season | < | Lab Test | Lab Result | Sample Date | Season | < | Lab Test | Lab Result | Sample Date | Season | < | Lab Test | Lab Result |
| 1/26/2005 | | | 4.43 | | 1/26/2005 | | | 0.1 | 0.10 | 1/26/2005 | | | 13.4 | 13.40 |
| 2/22/2005 | | | 2.85 | | 2/22/2005 | | L | 0.1 | 0.05 | 2/22/2005 | | | 9.77 | 9.77 |
| 3/31/2005 | | | 2.48 | | 3/31/2005 | | L | 0.1 | 0.05 | 3/31/2005 | | | 8.56 | 8.56 |
| 4/26/2005 | | | 5.4 | | 4/26/2005 | | | 0.2 | 0.20 | 4/26/2005 | | | 20.2 | 20.20 |
| 5/18/2005 | | | 3.37 | | 5/18/2005 | | L | 0.1 | 0.05 | 5/18/2005 | | | 11.3 | 11.30 |
| 6/30/2005 | | | 4.08 | | 6/30/2005 | | L | 0.1 | 0.05 | 6/30/2005 | | | 9.72 | 9.72 |
| 7/26/2005 | | | 3.74 | | 7/26/2005 | | L | 0.1 | 0.05 | 7/26/2005 | | | 12.6 | 12.60 |
| 8/11/2005 | | | 4 | | 8/11/2005 | | L | 0.1 | 0.05 | 8/11/2005 | | | 8.54 | 8.54 |
| 9/29/2005 | | | 5.93 | | 9/29/2005 | | L | 0.1 | 0.05 | 9/29/2005 | | | 27.5 | 27.50 |
| 10/25/2005 | | | 2.78 | | 10/25/2005 | | L | 0.1 | 0.05 | 10/25/2005 | | | 8.27 | 8.27 |
| 11/17/2005 | | | 9.51 | | 11/17/2005 | | L | 0.1 | 0.05 | 11/17/2005 | | | 38.7 | 38.70 |
| 12/13/2005 | | | 2.7 | | 12/13/2005 | | L | 0.1 | 0.05 | 12/13/2005 | | | 9.27 | 9.27 |
| 1/31/2006 | | | 4.52 | | 1/31/2006 | | L | 0.1 | 0.05 | 1/31/2006 | | | 20.5 | 20.50 |
| 2/14/2006 | | | 2.17 | | 2/14/2006 | | L | 0.1 | 0.05 | 2/14/2006 | | | 9.78 | 9.78 |
| 3/30/2006 | | | 2.75 | | 3/30/2006 | | L | 0.1 | 0.05 | 3/30/2006 | | | 10.8 | 10.80 |
| 4/25/2006 | | | 3.22 | | 4/25/2006 | | L | 0.1 | 0.05 | 4/25/2006 | | | 13.2 | 13.20 |
| 5/18/2006 | | | 3.9 | | 5/18/2006 | | L | 0.1 | 0.05 | 5/18/2006 | | | 16.8 | 16.80 |
| 6/29/2006 | | | 4.03 | | 6/29/2006 | | L | 0.1 | 0.05 | 6/29/2006 | | | 18.5 | 18.50 |
| 7/27/2006 | | | 3.45 | | 7/27/2006 | | L | 0.1 | 0.05 | 7/27/2006 | | | 10.9 | 10.90 |
| 8/16/2006 | | | 4.29 | | 8/16/2006 | | L | 0.1 | 0.05 | 8/16/2006 | | | 15 | 15.00 |
| 9/19/2006 | | | 4.53 | | 9/19/2006 | | L | 0.1 | 0.05 | 9/19/2006 | | | 17 | 17.00 |
| 10/11/2006 | | | 3.57 | | 10/11/2006 | | L | 0.1 | 0.05 | 10/11/2006 | | | 12.7 | 12.70 |
| 11/30/2006 | | | 3.21 | | 11/30/2006 | | L | 0.1 | 0.05 | 11/30/2006 | | | 14.3 | 14.30 |
| 12/20/2006 | | | 2.82 | | 12/20/2006 | | L | 0.1 | 0.05 | 12/20/2006 | | | 10.2 | 10.20 |
| 1/31/2007 | | | 2.63 | | 1/31/2007 | | L | 0.1 | 0.05 | 1/31/2007 | | | 9.55 | 9.55 |
| 2/28/2007 | | | 5.42 | | 2/28/2007 | | | 0.164 | 0.16 | 2/28/2007 | | | 19.6 | 19.60 |
| 3/27/2007 | | | 9.62 | | 3/27/2007 | | L | 0.1 | 0.05 | 3/27/2007 | | | 44 | 44.00 |
| 4/24/2007 | | | 3.06 | | 4/24/2007 | | L | 0.1 | 0.05 | 4/24/2007 | | | 10.9 | 10.90 |
| 5/16/2007 | | | 3.52 | | 5/16/2007 | | L | 0.1 | 0.05 | 5/16/2007 | | | 11.2 | 11.20 |
| 6/28/2007 | | | 6.33 | | 6/28/2007 | | L | 0.1 | 0.05 | 6/28/2007 | | | 19.3 | 19.30 |
| 7/26/2007 | | | 4.73 | | 7/26/2007 | | L | 0.1 | 0.05 | 7/26/2007 | | | 8.51 | 8.51 |
| 8/30/2007 | | | 5.09 | | 8/30/2007 | | L | 0.1 | 0.05 | 8/30/2007 | | | 10.9 | 10.90 |
| 9/26/2007 | | | 5.32 | | 9/26/2007 | | L | 0.1 | 0.05 | 9/26/2007 | | | 9.94 | 9.94 |
| 10/22/2007 | | | 5.88 | | 10/22/2007 | | L | 0.1 | 0.05 | 10/22/2007 | | | 11.7 | 11.70 |
| 11/1/2007 | | | 4.42 | | 11/1/2007 | | L | 0.1 | 0.05 | 11/1/2007 | | | 13.8 | 13.80 |
| 12/11/2007 | | | 4.11 | | 12/11/2007 | | L | 0.1 | 0.05 | 12/11/2007 | | | 19.5 | 19.50 |
| 1/23/2008 | | | 2.89 | | 1/23/2008 | | L | 0.1 | 0.05 | 1/23/2008 | | | 11.5 | 11.50 |
| 2/25/2008 | | | 2.91 | | 2/25/2008 | | L | 0.1 | 0.05 | 2/25/2008 | | | 14 | 14.00 |
| 3/27/2008 | | | 7.29 | | 3/27/2008 | | L | 0.1 | 0.05 | 3/27/2008 | | | 29.1 | 29.10 |
| 4/23/2008 | | | 2.56 | | 4/23/2008 | | L | 0.1 | 0.05 | 4/23/2008 | | | 10.9 | 10.90 |
| 5/22/2008 | | | 2.57 | | 5/22/2008 | | L | 0.1 | 0.05 | 5/22/2008 | | | 12 | 12.00 |
| 6/23/2008 | | | 4.12 | | 6/23/2008 | | L | 0.1 | 0.05 | 6/23/2008 | | | 14.6 | 14.60 |
| 7/30/2008 | | | 4.06 | | 7/30/2008 | | L | 0.1 | 0.05 | 7/30/2008 | | | 17.5 | 17.50 |
| 8/20/2008 | | | 3.38 | | 8/20/2008 | | L | 0.1 | 0.05 | 8/20/2008 | | | 9.46 | 9.46 |
| 9/18/2008 | | | 3.56 | | 9/18/2008 | | L | 0.1 | 0.05 | 9/18/2008 | | | 10.5 | 10.50 |
| 10/15/2008 | | | 4.24 | | 10/15/2008 | | L | 0.1 | 0.05 | 10/15/2008 | | | 10 | 10.00 |
| 11/13/2008 | | | 3.66 | | 11/13/2008 | | L | 0.1 | 0.05 | 11/13/2008 | | | 10.2 | 10.20 |
| 12/17/2008 | | | 2.81 | | 12/17/2008 | | L | 0.1 | 0.05 | 12/17/2008 | | | 11.9 | 11.90 |
| 1/29/2009 | | | 2.28 | | 1/29/2009 | | L | 0.1 | 0.05 | 1/29/2009 | | | 16.2 | 16.20 |
| 2/23/2009 | | | 3.11 | | 2/23/2009 | | L | 0.1 | 0.05 | 2/23/2009 | | | 12.6 | 12.60 |
| 3/30/2009 | | | 4.34 | | 3/30/2009 | | L | 0.1 | 0.05 | 3/30/2009 | | | 21.7 | 21.70 |
| 4/30/2009 | | | 5.71 | | 4/30/2009 | | L | 0.1 | 0.05 | 4/30/2009 | | | 21.7 | 21.70 |
| 5/13/2009 | | | 15.5 | | 5/13/2009 | | L | 0.1 | 0.05 | 5/13/2009 | | | 47.4 | 47.40 |
| 6/29/2009 | | | 3.38 | | 6/29/2009 | | L | 0.1 | 0.05 | 6/29/2009 | | | 11.6 | 11.60 |
| 7/29/2009 | | | 3.42 | | 7/29/2009 | | L | 0.1 | 0.05 | 7/29/2009 | | L | 6 | 3.00 |
| 8/17/2009 | | | 3.61 | | 8/17/2009 | | L | 0.1 | 0.05 | 8/17/2009 | | L | 6 | 3.00 |
| 9/24/2009 | | | 4.99 | | 9/24/2009 | | L | 0.1 | 0.05 | 9/24/2009 | | | 7.14 | 7.14 |
| 10/26/2009 | | | 2.78 | | 10/26/2009 | | L | 0.1 | 0.05 | 10/26/2009 | | | 9.36 | 9.36 |
| 11/17/2009 | | | 2.51 | | 11/17/2009 | | L | 0.1 | 0.05 | 11/17/2009 | | | 7.95 | 7.95 |
| 12/22/2009 | | | 2.92 | | 12/22/2009 | | L | 0.1 | 0.05 | 12/22/2009 | | | 8.13 | 8.13 |

| Nickel (Total) (ug/L) | | | Corrected | Nitrogen, Ammonia (mg/L) | | | Corrected | Zinc (Total) (ug/L) | | | Corrected |
|---|---|---|---|---|---|---|---|---|---|---|---|
| MF For Lab Data | | Lab Test | Lab Result | MF For Lab Data | 0.5 | Lab Test | Lab Result | MF For Lab Data | 0.5 | Lab Test | Lab Result |
| Samples | | 60 | | Samples | | | 60 | Samples | | | 60 |
| Minimum | | 2.17 | | Minimum | | | 0.05 | Minimum | | | 3.00 |
| Average | | 4.21 | | Average | | | 0.06 | Average | | | 14.46 |
| Maximum | | 15.50 | | Maximum | | | 0.20 | Maximum | | | 47.40 |
| STD_Deviation | | 2.12 | | STD_Deviation | | | 0.02 | STD_Deviation | | | 8.40 |
| CV | | 0.50 | | CV | | | 0.45 | CV | | | 0.58 |
| Geometeric MEAN | | 3.9 | | Geometeric MEAN | | | 0.05 | Geometeric MEAN | | | 13 |

**STATION SITE SELECTED : WR-134 , W Fk White River , SR 157, S of Worthington , Greene County** **ATTACHMENT 2**

| Copper (Total) (ug/L) | | | | Corrected | Sulfate (mg/l) | | | | BORON (ug/l) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample Date | Season | < | Lab Test | Lab Result | Sample Date | Season | < | Lab Test | Lab Result | Sample Date | Season | < | | Lab Result |
| 1/26/2005 | | | 3.79 | | 1/26/2005 | | | 45 | | | | | | |
| 2/22/2005 | | | 4.16 | | 2/22/2005 | | | 42 | | | | | | |
| 3/31/2005 | | | 2.95 | | 3/31/2005 | | | 53 | | | | | | |
| 4/26/2005 | | | 6.7 | | 4/26/2005 | | | 37 | | | | | | |
| 5/18/2005 | | | 4.07 | | 5/18/2005 | | | 50 | | | | | | |
| 6/30/2005 | | | 3.98 | | 6/30/2005 | | | 106 | | | | | | |
| 7/26/2005 | | | 5.26 | | 7/26/2005 | | | 49 | | | | | | |
| 8/11/2005 | | | 3.54 | | 8/11/2005 | | | 120 | | | | | | |
| 9/29/2005 | | | 8.16 | | 9/29/2005 | | | 39 | | | | | | |
| 10/25/2005 | | | 3.19 | | 10/25/2005 | | | 62 | | | | | | |
| 11/17/2005 | | | 10.1 | | 11/17/2005 | | | 38 | | | | | | |
| 12/13/2005 | | | 2.71 | | 12/13/2005 | | | 83 | | | | | | |
| 1/31/2006 | | | 5.36 | | 1/31/2006 | | | 58 | | | | | | |
| 2/14/2006 | | | 2.54 | | 2/14/2006 | | | 67 | | | | | | |
| 3/30/2006 | | | 3.13 | | 3/30/2006 | | | 53 | | | | | | |
| 4/25/2006 | | | 4.12 | | 4/25/2006 | | | 47 | | | | | | |
| 5/18/2006 | | | 5.69 | | 5/18/2006 | | | 41 | | | | | | |
| 6/29/2006 | | | 5.92 | | 6/29/2006 | | | 48 | | | | | | |
| 7/27/2006 | | | 4.01 | | 7/27/2006 | | | 56 | | | | | | |
| 8/16/2006 | | | 5.17 | | 8/16/2006 | | | 67 | | | | | | |
| 9/19/2006 | | | 5.44 | | 9/19/2006 | | | 56 | | | | | | |
| 10/11/2006 | | | 4.63 | | 10/11/2006 | | | 72 | | | | | | |
| 11/30/2006 | | | 3.74 | | 11/30/2006 | | | 45 | | | | | | |
| 12/20/2006 | | | 3.42 | | 12/20/2006 | | | 39 | | | | | | |
| 1/31/2007 | | | 3.03 | | 1/31/2007 | | | 50 | | | | | | |
| 2/28/2007 | | | 5.96 | | 2/28/2007 | | | 32.7 | | | | | | |
| 3/27/2007 | | | 11.3 | | 3/27/2007 | | | 22 | | | | | | |
| 4/24/2007 | | | 3.44 | | 4/24/2007 | | | 46 | | | | | | |
| 5/16/2007 | | | 3.85 | | 5/16/2007 | | | 65 | | | | | | |
| 6/28/2007 | | | 6.73 | | 6/28/2007 | | | 98 | | | | | | |
| 7/26/2007 | | | 3.04 | | 7/26/2007 | | | 97 | | | | | | |
| 8/30/2007 | | | 4.14 | | 8/30/2007 | | | 117 | | | | | | |
| 9/26/2007 | | | 4.2 | | 9/26/2007 | | | 159 | | | | | | |
| 10/22/2007 | | | 3.66 | | 10/22/2007 | | | 127 | | | | | | |
| 11/1/2007 | | | 3.31 | | 11/1/2007 | | | 101 | | | | | | |
| 12/11/2007 | | | 4.4 | | 12/11/2007 | | | 80 | | | | | | |
| 1/23/2008 | | | 3.09 | | 1/23/2008 | | | 62 | | | | | | |
| 2/25/2008 | | | 3.3 | | 2/25/2008 | | | | | | | | | |
| 3/27/2008 | | | 6.3 | | 3/27/2008 | | | 34 | | | | | | |
| 4/23/2008 | | | 2.97 | | 4/23/2008 | | | 49 | 89 | | | | | |
| 5/22/2008 | | | 3.17 | | 5/22/2008 | | | 44 | 68.1 | | | | | |
| 6/23/2008 | | | 4.31 | | 6/23/2008 | | | 54 | 104 | | | | | |
| 7/30/2008 | | | 5.34 | | 7/30/2008 | | | 63 | 129 | | | | | |
| 8/20/2008 | | | 3.18 | | 8/20/2008 | | | 55 | 132 | | | | | |
| 9/18/2008 | | | 3.48 | | 9/18/2008 | | | 114 | 250 | | | | | |
| 10/15/2008 | | | 3.14 | | 10/15/2008 | | | 128 | 268 | | | | | |
| 11/13/2008 | | | 2.63 | | 11/13/2008 | | | 120 | 243 | | | | | |
| 12/17/2008 | | | 2.57 | | 12/17/2008 | | | 94 | 179 | | | | | |
| 1/29/2009 | | | 2.25 | | 1/29/2009 | | | 97 | 159 | | | | | |
| 2/23/2009 | | | 3.36 | | 2/23/2009 | | | 47 | 100 | | | | | |
| 3/30/2009 | | | 4.83 | | 3/30/2009 | | | 76 | 128 | | | | | |
| 4/30/2009 | | | 6.46 | | 4/30/2009 | | | 28 | 57.2 | | | | | |
| 5/13/2009 | | | 11.4 | | 5/13/2009 | | | 36 | 62.2 | | | | | |
| 6/29/2009 | | | 4.18 | | 6/29/2009 | | | 46 | 98.2 | | | | | |
| 7/29/2009 | | | 2.59 | | 7/29/2009 | | | 78 | 145 | | | | | |
| 8/17/2009 | | | 2.14 | | 8/17/2009 | | | 96 | 236 | | | | | |
| 9/24/2009 | | | 2.86 | | 9/24/2009 | | | 142 | 292 | | | | | |
| 10/26/2009 | | | 3.49 | | 10/26/2009 | | | 59 | 95.2 | | | | | |
| 11/17/2009 | | | 2.14 | | 11/17/2009 | | | 103 | 172 | | | | | |
| 12/22/2009 | | | 2.3 | | 12/22/2009 | | | 60 | 87.2 | | | | | |

| Copper (Total) (ug/L) | | | Corrected | Sulfate (mg/l) | | | BORON (ug/l) | | | | Corrected |
|---|---|---|---|---|---|---|---|---|---|---|---|
| MF For Lab Data | | Lab Test | Lab Result | MF For Lab Data | | Lab Test | Lab Test | MF For Lab Dat | | | Lab Resul |
| Samples | | 60 | | Samples | | 59 | 21 | Samples | | | |
| Minimum | | 2.14 | | Minimum | | 22.00 | 57.20 | Minimum | | | |
| Average | | 4.34 | | Average | | 68.69 | 147.34 | Average | | | |
| Maximum | | 11.40 | | Maximum | | 159.00 | 292.00 | Maximum | | | |
| STD_Deviation | | 2.01 | | STD_Deviation | | 31.59 | 71.99 | STD_Deviation | | | |
| CV | | 0.46 | | CV | | 0.46 | 0.49 | CV | | | |
| Geometeric MEAN | | 4.0 | | Geometeric MEAN | | 62 | 132 | | | | |

**STATION SITE SELECTED : WR-CENTERTON , W Fk White River , Blue Bluff Rd, Centerton , Morgan County** **ATTACHMENT 2**

| | | Fluoride (mg/l) Gen Chem Data | Antimony (ug/L) Trace Data | Barium (Total) (ug/L) Sample Date | | Trace Metal Data | Manganese (ug/l) Trace Data | Beryllium (Total) (ug/L) Sample Date | | < | Trace Metal Data | Corrected Trace Data |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2/14/2002 | W | 0.28 | 0.38 | 2/14/2002 | | 71 | 33 | 2/14/2002 | | | 0.01 | 0.01 |
| 5/21/2002 | S | 0.2 | 0.43 | 5/21/2002 | | 50 | 56 | 5/21/2002 | | | 0.0337 | 0.0337 |
| 8/15/2002 | S | 0.57 | 2.34 | 8/15/2002 | | 69 | 46 | 8/15/2002 | | L | 0.033 | 0.017 |
| 11/19/2002 | S | 0.32 | 0.95 | 11/19/2002 | | 63 | 58 | 11/19/2002 | | | 0.0151 | 0.0151 |
| 3/11/2003 | W | 0.16 | 0.3 | 3/11/2003 | | 71 | 124 | 3/11/2003 | | | 0.0917 | 0.0917 |
| 6/17/2003 | S | 0.3 | 0.77 | 6/17/2003 | | 70 | 62 | 6/17/2003 | | | 0.0245 | 0.0245 |
| 9/23/2003 | S | 0.28 | 0.6 | 9/23/2003 | | 63 | 68 | 9/23/2003 | | | 0.0161 | 0.0161 |
| 12/16/2003 | W | 0.22 | 0.32 | 12/16/2003 | | 67 | 33 | 12/16/2003 | | L | 0.033 | 0.017 |
| 3/23/2004 | W | 0.27 | 0.46 | 3/23/2004 | | 67 | 29 | 3/23/2004 | | L | 0.033 | 0.017 |
| 8/24/2004 | S | | 0.84 | 8/24/2004 | | 71 | 58 | 8/24/2004 | | | 0.0164 | 0.0164 |
| 10/14/2004 | S | | 1.4 | 10/14/2004 | | 76 | 60 | 10/14/2004 | | | 0.0256 | 0.0256 |
| 2/23/2005 | W | | 0.32 | 2/23/2005 | | 67 | 40 | 2/23/2005 | | | 0.0189 | 0.0189 |
| 6/28/2005 | S | | 1.18 | 6/28/2005 | | 74 | 63 | 6/28/2005 | | | 0.0154 | 0.0154 |
| 9/14/2005 | S | | 1.05 | 9/14/2005 | | 76 | 61.8 | 9/14/2005 | | | 0.013 | 0.013 |
| 12/14/2005 | W | | 0.47 | 12/14/2005 | | 79 | 50.1 | 12/14/2005 | | L | 0.033 | 0.017 |
| 3/8/2006 | W | 0.32 | 0.83 | 3/8/2006 | | 76 | 39 | 3/8/2006 | | L | 0.033 | 0.017 |
| 5/1/2006 | | 0.219 | | | | | | | | | | |

| MF For Lab Data | Fluoride (mg/l) Gen Chem Data | Antimony (ug/L) Trace Data | MF For Lab Data | Barium (Total) (ug/L) | | Manganese (ug/l) | MF For Lab Data | Beryllium (Total) (ug/L) 0.5 | | Corrected Trace Data |
|---|---|---|---|---|---|---|---|---|---|---|
| Samples | 11 | 16 | Samples | 16 | | 16 | Samples | | | 16 |
| Minimum | 0.16 | 0.30 | Minimum | 50.00 | | 29.00 | Minimum | | | 0.01 |
| Average | 0.29 | 0.79 | Average | 69.38 | | 55.06 | Average | | | 0.02 |
| Maximum | 0.57 | 2.34 | Maximum | 79.00 | | 124.00 | Maximum | | | 0.09 |
| STD_Deviation | 0.11 | 0.53 | STD_Deviation | 6.97 | | 22.16 | STD_Deviation | | | 0.02 |
| CV | 0.38 | 0.67 | CV | 0.10 | | 0.40 | CV | | | 0.85 |
| Geometeric MEAN | 0.27 | 0.66 | Geometeric MEAN | 69 | | 52 | Geometeric MEAN | | | 0.019 |

**STATION SITE SELECTED : WR-CENTERTON , W Fk White River , Blue Bluff Rd, Centerton , Morgan County** — **ATTACHMENT 2**

| Selenium (Total) (ug/L) Sample Date | | < | Trace Metal Data | Corrected Trace Data | Silver (Total) (ug/L) Sample Date | | < | Trace Metal Data | | Thallium (Total) (ug/L) Sample Date | | < | Trace Metal Data | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2/14/2002 | | | 1.7 | 1.7 | 2/14/2002 | | | 0.013 | | 2/14/2002 | | | 0.021 | |
| 5/21/2002 | | L | 0.9 | 0.45 | 05/21/02 | | | 0.0314 | | 5/21/2002 | | | 0.0261 | |
| 8/15/2002 | | | 1.1 | 1.1 | 8/15/2002 | | | 0.0238 | | 8/15/2002 | | | 0.0276 | |
| 11/19/2002 | | L | 0.9 | 0.45 | 11/19/2002 | | | 0.03 | | 11/19/2002 | | | 0.0216 | |
| 3/11/2003 | | | 0.9 | 0.9 | 3/11/2003 | | | 0.092 | | 3/11/2003 | | | 0.0498 | |
| 6/17/2003 | | | 0.4 | 0.4 | 06/17/03 | | | 0.068 | | 6/17/2003 | | | 0.0309 | |
| 9/23/2003 | | L | 0.9 | 0.45 | 9/23/2003 | | | 0.0253 | | 9/23/2003 | | | 0.0255 | |
| 12/16/2003 | | L | 0.9 | 0.45 | 12/16/2003 | | | 0.0198 | | 12/16/2003 | | | 0.0129 | |
| 3/23/2004 | | | 0.7 | 0.7 | 3/23/2004 | | | 0.0069 | | 3/23/2004 | | | 0.009 | |
| 8/24/2004 | | | 1.8 | 1.8 | 8/24/2004 | | | 0.0219 | | 8/24/2004 | | | 0.0306 | |
| 10/14/2004 | | | 3.3 | 3.3 | 10/14/2004 | | | 0.027 | | 10/14/2004 | | | 0.0326 | |
| 2/23/2005 | | | 1.9 | 1.9 | 2/23/2005 | | | 0.0215 | | 2/23/2005 | | | 0.0363 | |
| 6/28/2005 | | | 2.3 | 2.3 | 6/28/2005 | | | 0.0228 | | 6/28/2005 | | | 0.0378 | |
| 9/14/2005 | | | 2.5 | 2.5 | 9/14/2005 | | | 0.0147 | | 9/14/2005 | | | 0.0331 | |
| 12/14/2005 | | | 2.3 | 2.3 | 12/14/2005 | | | 0.0113 | | 12/14/2005 | | | 0.0261 | |
| 3/8/2006 | | | 3.6 | 3.6 | 3/8/2006 | | | 0.0124 | | 3/8/2006 | | | 0.0188 | |

| Selenium (Total) (ug/L) | | | Corrected Trace Data | Silver (Total) (ug/L) | | Trace Metal Data | | Thallium (Total) (ug/L | Trace Metal Data | |
|---|---|---|---|---|---|---|---|---|---|---|
| MF For Lab Data | 0.5 | | | MF For Lab Data | | | | MF For Lab Data | | |
| Samples | | | 16 | Samples | | 16 | | Samples | 16 | |
| Minimum | | | 0.40 | Minimum | | 0.01 | | Minimum | 0.01 | |
| Average | | | 1.52 | Average | | 0.03 | | Average | 0.03 | |
| Maximum | | | 3.60 | Maximum | | 0.09 | | Maximum | 0.05 | |
| STD_Deviation | | | 1.06 | STD_Deviation | | 0.02 | | STD_Deviation | 0.01 | |
| CV | | | 0.70 | CV | | 0.80 | | CV | 0.36 | |
| Geometeric MEAN | | | 1.2 | Geometeric MEAN | | 0.022 | | Geometeric MEAN | 0.026 | |

**STATION SITE SELECTED : WR-81 , W Fk White River , SR 358 Bridge, SE of Edwardsport , Daviess County** **ATTACHMENT 2**

| Sample Date | Season | < | pH | | pH Summer Field | Season | < | pH Winter Field | | Sample Date | Hardness (mg/l) Lab Test | Chloride (mg/l) Lab Test |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1/26/2005 | | | 7.9 | | | | | 7.9 | | 1/26/2005 | 237 | 38 |
| 2/21/2005 | | | 7.7 | | | | | 7.7 | | 2/21/2005 | 250 | 36 |
| 3/30/2005 | | | 8.3 | | | | | 8.3 | | 3/30/2005 | 264 | 53 |
| 4/25/2005 | | | 8.0 | | | | | 8.0 | | 4/25/2005 | 198 | 44 |
| 5/18/2005 | | | 8.1 | | 8.1 | | | | | 5/18/2005 | 236 | 34 |
| 6/30/2005 | | | 8.5 | | 8.5 | | | | | 6/30/2005 | 243 | 55 |
| 7/25/2005 | | | 8.4 | | 8.4 | | | | | 7/25/2005 | 207 | 41 |
| 8/10/2005 | | | 8.3 | | 8.3 | | | | | 8/10/2005 | 235 | 69 |
| 9/28/2005 | | | 7.9 | | 7.9 | | | | | 9/28/2005 | 221 | 36 |
| 10/24/2005 | | | 8.0 | | 8.0 | | | | | 10/24/2005 | 200 | 45 |
| 11/17/2005 | | | 7.4 | | 7.4 | | | | | 11/17/2005 | 162 | 21 |
| 12/12/2005 | | | 8.0 | | | | | 8.0 | | 12/12/2005 | 291 | 56 |
| 1/30/2006 | | | 7.9 | | | | | 7.9 | | 1/30/2006 | 278 | 38 |
| 2/13/2006 | | | 7.9 | | | | | 7.9 | | 2/13/2006 | 277 | 42 |
| 3/29/2006 | | | 7.8 | | | | | 7.8 | | 3/29/2006 | 263 | 38 |
| 4/24/2006 | | | 7.9 | | | | | 7.9 | | 4/24/2006 | 239 | 33 |
| 5/17/2006 | | | 8.0 | | 8.0 | | | | | 5/17/2006 | 232 | 29 |
| 6/29/2006 | | | 8.0 | | 8.0 | | | | | 6/29/2006 | 211 | 31 |
| 7/27/2006 | | | 8.4 | | 8.4 | | | | | 7/27/2006 | 244 | 41 |
| 8/17/2006 | | | 8.2 | | 8.2 | | | | | 8/17/2006 | 288 | 73 |
| 9/18/2006 | | | 8.1 | | 8.1 | | | | | 9/18/2006 | 228 | 48 |
| 10/11/2006 | | | 8.2 | | 8.2 | | | | | 10/11/2006 | 308 | 72 |
| 11/29/2006 | | | 8.1 | | 8.1 | | | | | 11/29/2006 | 294 | 35 |
| 12/20/2006 | | | 8.0 | | | | | 8.0 | | 12/20/2006 | 275 | 30 |
| 1/31/2007 | | | 7.9 | | | | | 7.9 | | 1/31/2007 | 277 | 29 |
| 2/28/2007 | | | 7.9 | | | | | 7.9 | | 2/28/2007 | 134 | 47 |
| 3/26/2007 | | | 7.8 | | | | | 7.8 | | 3/26/2007 | 201 | 29 |
| 4/23/2007 | | | 8.0 | | | | | 8.0 | | 4/23/2007 | 248 | 31 |
| 5/16/2007 | | | 8.2 | | 8.2 | | | | | 5/16/2007 | 285 | 42 |
| 6/28/2007 | | | 8.1 | | 8.1 | | | | | 6/28/2007 | 241 | 48 |
| 7/26/2007 | | | 8.4 | | 8.4 | | | | | 7/26/2007 | 236 | 71 |
| 8/29/2007 | | | 8.7 | | 8.7 | | | | | 8/29/2007 | 250 | 77 |
| 9/26/2007 | | | 7.8 | | 7.8 | | | | | 9/26/2007 | 252 | 94 |
| 10/23/2007 | | | 8.2 | | 8.2 | | | | | 10/23/2007 | 308 | 110 |
| 11/1/2007 | | | 8.3 | | 8.3 | | | | | 11/1/2007 | 313 | 81 |
| 12/11/2007 | | | 8.3 | | | | | 8.3 | | 12/11/2007 | 282 | 62 |
| 1/23/2008 | | | 8.3 | | | | | 8.3 | | 1/23/2008 | 272 | 52 |
| 2/25/2008 | | | 8.0 | | | | | 8.0 | | 2/25/2008 | 230 | 46 |
| 3/27/2008 | | | 8.0 | | | | | 8.0 | | 3/27/2008 | 260 | 40 |
| 4/24/2008 | | | 8.2 | | | | | 8.2 | | 4/24/2008 | 271 | 35 |
| 5/22/2008 | | | 8.1 | | 8.1 | | | | | 5/22/2008 | 268 | 30 |
| 6/23/2008 | | | 8.1 | | 8.1 | | | | | 6/23/2008 | 268 | 28 |
| 7/30/2008 | | | 8.2 | | 8.2 | | | | | 7/30/2008 | 236 | 31 |
| 8/20/2008 | | | 8.3 | | 8.3 | | | | | 8/20/2008 | 253 | 41 |
| 9/17/2008 | | | 8.3 | | 8.3 | | | | | 9/17/2008 | 320 | 75 |
| 10/14/2008 | | | 8.4 | | 8.4 | | | | | 10/14/2008 | 359 | 96 |
| 11/13/2008 | | | 8.2 | | 8.2 | | | | | 11/13/2008 | 342 | 78 |
| 12/18/2008 | | | 8.1 | | | | | 8.1 | | 12/18/2008 | 279 | 73 |
| 1/29/2009 | | | 8.0 | | | | | 8.0 | | 1/29/2009 | 346 | 75 |
| 2/23/2009 | | | 8.0 | | | | | 8.0 | | 2/23/2009 | 253 | 42 |
| 3/30/2009 | | | 8.7 | | | | | 8.7 | | 3/30/2009 | 250 | 45 |
| 4/29/2009 | | | 8.2 | | | | | 8.2 | | 4/29/2009 | 245 | 31 |
| 5/14/2009 | | | 7.9 | | 7.9 | | | | | 5/14/2009 | 181 | 18 |
| 6/29/2009 | | | 8.2 | | 8.2 | | | | | 6/29/2009 | 256 | 32 |
| 7/29/2009 | | | 8.3 | | 8.3 | | | | | 7/29/2009 | 233 | 53 |
| 8/17/2009 | | | 8.0 | | 8.0 | | | | | 8/17/2009 | 204 | 51 |
| 9/23/2009 | | | 8.3 | | 8.3 | | | | | 9/23/2009 | 279 | 80 |
| 10/26/2009 | | | 8.0 | | 8.0 | | | | | 10/26/2009 | 250 | 52 |
| 11/16/2009 | | | 8.3 | | 8.3 | | | | | 11/16/2009 | 334 | 48 |
| 12/21/2009 | | | 7.8 | | | | | 7.8 | | 12/21/2009 | 245 | 35 |

| | | | pH Summer | | pH Winter | | | | |
|---|---|---|---|---|---|---|---|---|---|
| MF For Lab Data | | Lab Test | MF For Lab Data | | Lab Test | | MF For Lab Data | Lab Test | Lab Test |
| Samples | | 60 | 35 | | 25 | | Samples | 60 | 60 |
| Minimum | | 7.40 | 7.40 | | 7.70 | | Minimum | 134 | 18 |
| Average | | 8.11 | 8.17 | | 8.02 | | Average | 256 | 49.1 |
| Maximum | | 8.73 | 8.73 | | 8.68 | | Maximum | 359 | 110 |
| STD_Deviation | | 0.23 | 0.23 | | 0.21 | | STD_Deviation | 42.57 | 20.06 |
| CV | | 0.03 | 0.03 | | 0.03 | | CV | 0.17 | 0.41 |
| **Percentile 75%** | | **8.3** | **8.3** | | **8.1** | | Percentile 50% | 251 | 43 |

# ATTACHMENT 3

## Calculation of Preliminary Effluent Limitations for Discharges in the Non-Great Lakes System (Excluding Discharges to the Ohio River)

| General Information | |
|---|---|
| Facility Name: | Duke Energy Edwardsport Generating Station |
| County: | Knox |
| NPDES Number: | IN0002780 |
| WLA Number: | 001761 |
| WLA Report Date: | 3/24/2010 |
| Outfall: | 002 |
| Receiving Stream: | West Fork White River |

| Receiving Stream Questions (Yes or No) | |
|---|---|
| Acute Mixing Zone Allowed? | No |
| Public Water System (PWS) Intake Downstream? | No |
| Industrial Water Supply (IWS) Intake Downstream? | No |
| Interstate Wabash River Discharge? | No |
| Put-and-Take Trout Fishing? | No |
| Fish Early Life Stages Present? | Yes |

| Effluent Flow | = | 3.756 mgd |
|---|---|---|

| Receiving Stream Design Flows | | |
|---|---|---|
| Q7,10 (Outfall) | = | 398 cfs |
| Q7,10 (Public Water System Intake) | = | cfs |
| Q7,10 (Industrial Water Supply Intake) | = | cfs |
| Q30,10 (Outfall) | = | 443 cfs |
| Q50 (Outfall) | = | 2980 cfs |
| Q50 (Public Water System Intake) | = | cfs |

| Ambient Downstream Water Quality Characteristics | | |
|---|---|---|
| Hardness (50th percentile) | = | 251 mg/l |
| Chloride (50th percentile) | = | 43 mg/l |
| pH (50th percentile) | = | s.u. |
| **Acute Ammonia-N** | | |
| Summer pH (75th percentile) | = | 7.8 s.u. |
| Winter pH (75th percentile) | = | 7.8 s.u. |
| **Chronic Ammonia-N** | | |
| Summer Temperature (75th percentile) | = | 25 C |
| Summer pH (75th percentile) | = | 8.3 s.u. |
| Winter Temperature (75th percentile) | = | 10 C |
| Winter pH (75th percentile) | = | 8.1 s.u. |

| Mixing Zone Dilution | | | | |
|---|---|---|---|---|
| Dilution Factor (for acute mixing zone) | = | | | |
| | | Dilution Fraction | Flow | Location |
| Chronic Aquatic Life (Except Ammonia) | = | 50% | Q7,10 | Outfall |
| Chronic Aquatic Life (Ammonia Only) | = | 50% | Q30,10 | Outfall |
| Chronic WET | = | 25% | Q7,10 | Outfall |
| Human Noncancer Drinking Water | = | 100% | Q7,10 | PWS Intake |
| Human Noncancer Nondrinking Water | = | 50% | Q7,10 | Outfall |
| Human Cancer Drinking Water | = | 100% | Q50 | PWS Intake |
| Human Cancer Nondrinking Water | = | 25% | Q50 | Outfall |
| Public Water Supply | = | 100% | Q7,10 | PWS Intake |
| Industrial Water Supply | = | 100% | Q7,10 | IWS Intake |

| Metals Translators (dissolved to total recoverable) | | |
|---|---|---|
| | Acute | Chronic |
| Aluminum | 1.000 | 1.000 |
| Antimony | 1.000 | 1.000 |
| Arsenic | 1.000 | 1.000 |
| Barium | 1.000 | 1.000 |
| Beryllium | 1.000 | 1.000 |
| Cadmium | 0.905 | 0.870 |
| Chromium III | 0.316 | 0.860 |
| Cobalt | 1.000 | 1.000 |
| Copper | 0.960 | 0.960 |
| Iron | 1.000 | 1.000 |
| Lead | 0.657 | 0.657 |
| Manganese | 1.000 | 1.000 |
| Molybdenum | 1.000 | 1.000 |
| Nickel | 0.998 | 0.997 |
| Silver | 0.85 | |
| Strontium | 1.000 | 1.000 |
| Thallium | 1.000 | 1.000 |
| Tin | 1.000 | 1.000 |
| Titanium | 1.000 | 1.000 |
| Vanadium | 1.000 | 1.000 |
| Zinc | 0.978 | 0.986 |

| Source of Criteria [1] | | | | | | | Background (Outfall) (ug/l) | Background (Intake) (ug/l) | Remove Mixing Zone? (Yes or Blank) | Samples/ Month | CV | Facility Specific CV? (Yes or No) | CAS Number | Parameters[2] | Indiana Water Quality Criteria for the Non-Great Lakes System (ug/l) A: Aquatic Life Criteria Acute (AAC) | A: Aquatic Life Criteria Chronic (CAC) | B: Human Health Noncancer Criteria Drinking (HNC-D) | B: Human Health Noncancer Criteria Nondrinking (HNC-N) | C: Human Health Cancer Criteria Drinking (HCC-D) | C: Human Health Cancer Criteria Nondrinking (HCC-N) | D: Add. PWS Criteria (PWS) | Preliminary Effluent Limitations: Concentration (ug/l)[3] Average | Concentration (ug/l)[3] Maximum | Mass (lbs/day) Average | Mass (lbs/day) Maximum | Criteria Type [4] | Basis |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A | B | C | D | E | F | G | | | | | | | | | | | | | | | | | | | | |
| 8 | 8 | 1 | 1 | | | 8 | 0.66 | | | 4 | 0.6 | No | 7440360 | Antimony | 720 | 80 | 146 | 45000 | | | 6 | 720 | 1400 | 23 | 44 | SV[8] | AAC |
| 1 | 1 | 8 | | | | 8 | 2 | | | 4 | 0.6 | No | 7440382 | Arsenic III[5] | 360 | 190 | 5 | | | | 10 | 360 | 720 | 11 | 23 | Tier I | AAC |
| 8 | 8 | 1 | 8 | | | 8 | 69 | | | 4 | 0.6 | No | 7440393 | Barium[7] | 3322.27 | 1164.33 | 1000 | 160000 | | | 2000 | 3300 | 6600 | 100 | 210 | SV[8] | AAC |
| 8 | 8 | 8 | 8 | 1 | 1 | 8 | 0.019 | | | 4 | 0.6 | No | 7440417 | Beryllium[5][7] | 220.60 | 24.49 | 40 | 300 | 0.068 | 1.17 | 4 | 150 | 360 | 4.7 | 11 | Tier I | HCC-N[9] |
| 1 | 1 | 1 | 8 | | | 8 | 0.5 | | | 4 | 0.6 | No | 7440439 | Cadmium[5][7] | 10.03 | 2.03 | 10 | 1400 | | | 5 | 11 | 22 | 0.34 | 0.69 | Tier I | AAC |
| 1 | 1 | 1 | 1 | | | 8 | 1.7 | | | 4 | 0.6 | No | 16065831 | Chromium (III)[7] | 1166 | 378 | 170000 | 3433000 | | | 100 | 3678.48 | 7379.74 | 115.30 | 231.31 | Tier I | AAC |
| 1 | 1 | 1 | 8 | | | | 0 | | | 4 | 0.6 | No | 18540299 | Chromium (VI) | 15.71 | 10.58 | 50 | 25000 | | | | 16 | 31 | 0.5 | 0.97 | Tier I | AAC |
| | | | | | | | | | | 4 | | No | 7440473 | Total Chromium | | | | | | | | 3700 | 7400 | 120 | 230 | Tier I | AAC |
| 1 | 1 | 8 | 8 | | | | 4 | | | 4 | 0.6 | No | 7440508 | Copper[7] | 40.50 | 24.92 | 280 | 56000 | | | | 42 | 84 | 1.3 | 2.6 | Tier I | AAC |
| 7 | 7 | | | | | | 1260 | | | 4 | 0.6 | No | 7439896 | Iron | 2744 | 2495 | | | | | | 2700 | 5500 | 85 | 170 | SSC | AAC |
| 1 | 1 | 1 | 8 | | | | 1.5 | | | 4 | 0.6 | No | 7439921 | Lead[5][7] | 173.07 | 6.74 | 50 | 190 | | | | 250 | 510 | 7.8 | 16 | Tier I | CAC |
| 8 | 8 | 8 | 8 | | | | 52 | | | 4 | 0.6 | No | 7439965 | Manganese[7] | 2554 | 1187 | 1300 | 59000 | | | | 2500 | 5100 | 78 | 160 | SV[8] | AAC |
| 1 | 1 | 1 | 1 | | | 8 | | | Yes | 1 | 0.6 | No | 7439976 | Mercury[6] | 2.4 | 0.012 | 0.14 | 0.15 | | | 2 | 0.012 | 0.02 | 0.00038 | 0.00063 | Tier I | CAC[9] |
| 1 | 1 | 1 | 1 | | | | 3.9 | | | 4 | 0.6 | No | 7440020 | Nickel[7] | 3083.22 | 342.42 | 13.4 | 100 | | | | 3100 | 6200 | 97 | 190 | Tier I | AAC |
| 1 | 1 | 1 | 8 | | | 8 | 1.2 | | | 4 | 0.6 | No | 7782492 | Selenium | 130 | 35 | 10 | 3400 | | | 50 | 130 | 260 | 4.1 | 8.1 | Tier I | AAC |
| 1 | | 1 | 8 | | | | 0.022 | | | 4 | 0.6 | No | 7440224 | Silver[7] | 8.40 | | 50 | 26000 | | | | 9.9 | 20 | 0.31 | 0.63 | Tier I | AAC |
| 6 | 6 | 1 | 1 | | | 8 | 0.026 | | | 4 | 0.6 | No | 7440280 | Thallium | 86 | 35 | 13 | 48 | | | 2 | 86 | 170 | 2.7 | 5.3 | Tier II | AAC |
| 1 | 1 | 8 | 8 | | | | 13 | | | 4 | 0.6 | No | 7440666 | Zinc[7] | 249.60 | 227.93 | 9000 | 250000 | | | | 250 | 510 | 7.8 | 16 | Tier I | AAC |
| 8 | 8 | 1 | 8 | | | | 0 | | | 4 | 0.6 | No | 108952 | Phenol | 1300 | 180 | 3500 | 2300 | | | | 1300 | 2600 | 41 | 81 | SV[8] | AAC |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | 7664417 | Total Ammonia (as N)[7] | | | | | | | | | | | | | |
| 4 | 4 | | | | | | 50 | | | 4 | 0.6 | No | | Summer | 12138.81 | 775.35 | | | | | | 12000 | 24000 | 380 | 750 | Tier I | AAC |
| 4 | 4 | | | | | | 50 | | | 4 | 0.6 | No | | Winter | 12138.81 | 2097.16 | | | | | | 12000 | 24000 | 380 | 750 | Tier I | AAC |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5 | 5 | 8 | 8 | | | | 132 | | | 4 | 0.6 | No | 7440428 | Boron | 30000 | 8800 | 1900 | 160000 | | | | 30000 | 60000 | 940 | 1900 | Tier I | AAC |
| 1 | 1 | | | | | 1 | 56000 | | | 4 | 0.6 | No | 1688706 | Chloride | 860000 | 230000 | | | | | 250000 | 860000 | 1700000 | 27000 | 53000 | Tier I | AAC |
| 1 | 1 | | | | | | 0 | | | 4 | 0.6 | No | 7782505 | Chlorine (total residual) | 19 | 11 | | | | | | 20 | 40 | 0.63 | 1.3 | Tier I | AAC |
| 1 | 1 | | | | | 8 | 0 | | | 4 | 0.6 | No | 57125 | Cyanide, Free | 22 | 5.2 | | | | | 200 | 22 | 44 | 0.69 | 1.4 | Tier I | AAC |
| | | 1 | 8 | | | | 0 | | | 4 | 0.6 | No | 57125 | Cyanide, Total | | | 200 | 48000 | | | | 1700000 | 4100000 | 53000 | 130000 | SV[8] | HNC-N[9] |
| 8 | 2 | | | | | 8 | 270 | | | 4 | 0.6 | No | 16984488 | Fluoride | 12000 | 2000 | | | | | 4000 | 12000 | 24000 | 380 | 750 | SV[8] | AAC |
| | 2 | | | | | 1 | 62000 | | | 4 | 0.6 | No | 14808798 | Sulfate[7] | | 1687762 | | | | | 250000 | 47000000 | 94000000 | 1500000 | 2900000 | Tier I | SNE |

[1] Source of Criteria
1) Indiana numeric water quality criterion in 327 IAC 2-1-6(a)(3), Table 6-1 or Table 6-2, or in 327 IAC 2-1-6(e).
2) "Shall not exceed" (SNE) criterion in 327 IAC 2-1-6(a)(3), Table 6-1 or 327 IAC 2-1-6(a)(5). This criterion is treated as a 4-day average criterion and is implemented in the same manner as the chronic aquatic life criterion.
3) Industrial water supply (IWS) criterion in 327 IAC 2-1-6(f). This criterion is treated as a 4-day average criterion and is implemented in the same manner as the chronic aquatic life criterion.
4) Acute (1-hour average) and chronic (30-day average) criteria for total ammonia nitrogen in "1999 Update of Ambient Water Quality Criteria for Ammonia," EPA-822-R-99-014, December 1999.
5) Tier I criterion derived using the methodology in 327 IAC 2-1-8.2 or 327 IAC 2-1-8.3 when the Method 1 data set is available, or using the methodology in 327 IAC 2-1-8.4, 327 IAC 2-1-8.5 or 327 IAC 2-1-8.6.
6) Tier II criterion derived using the methodology in 327 IAC 2-1-8.2 or 327 IAC 2-1-8.3 when the Method 1 data set is not available.
7) Site-specific water quality criterion (SSC) in 327 IAC 2-1-8.9, Table 8.9-1 or developed under 327 IAC 2-1-8.9.
8) Screening value (SV).
9) Numeric interpretation of narrative criterion for toxicity using U.S. EPA recommended water quality criteria for whole effluent toxicity (WET).
[2] The aquatic life criteria and screening values for all metals except mercury and selenium are in the form of dissolved metal. The aquatic life criteria for mercury and selenium are in the form of total recoverable metal.
The human health criteria and screening values and the public water supply screening values for all the metals are in the form of total recoverable metal.
[3] The preliminary effluent limitations (PELs) for the metals are in the form of total recoverable metal (with the exception of Chromium (VI) which is in the form of dissolved metal).
[4] See the table "Indiana Water Quality Criteria for the Non-Great Lakes System" for information on the type and source of criteria.
[5] The above-noted substances are probable or known human carcinogens.
[6] The above-noted substances are bioaccumulative chemicals of concern (BCCs). Beginning January 1, 2004, the water quality criteria for a BCC shall be applied directly to the undiluted discharge for all discharges of a BCC.
To apply the water quality criteria for a BCC directly to the undiluted discharge, enter "Yes" in the "Remove Mixing Zone?" column.
[7] The above noted substances have a criterion that is a function of an ambient downstream water quality characteristic. See the table "Indiana Water Quality Criteria for the Non-Great Lakes System" for information on the criterion equation.
[8] Limits based on screening values (as indicated by SV) ARE NOT to be used as water quality-based effluent limitations. These are solely to be used as preliminary effluent limitations.
[9] The monthly average PEL was set equal to the most stringent WLA because the calculated monthly average PEL exceeded the most stringent WLA and a facility-specific CV was not determined.

Last revised: October 15, 2009

# Appendix B

Anti Degradation Demonstration

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June 10, 2010

Mr. Richard Hamblin, Permits Manager
Industrial NPDES Permits Section
Office of Water Quality
Indiana Department of Environmental Management
MC 65-42 PS, IGCN 1255
100 N. Senate Avenue
Indianapolis, IN 46204-2251

2010 JUN 10 P 3:02
IDEM
OFFICE OF
WATER QUALITY

**RE: Antidegradation Analysis and Demonstration**
**Duke Energy Indiana, Inc.**
**Application for Renewal of NPDES Permit No. IN0002780**
**Edwardsport Generating Station/Edwardsport IGCC Station**

Dear Mr. Hamblin:

Enclosed for your agency's review and action is Duke Energy Indiana, Inc.'s Antidegradation Analysis and Demonstration that is being submitted in support of Duke Energy's pending application for renewal of NPDES Permit No. IN0002780 for the Edwardsport Generating Station and the Edwardsport IGCC Station.

Please contact Howard Lewis, of Duke Energy Indiana, at 317/838-1661 or me at my above-listed direct line with any questions or communications concerning the enclosed document.

Very truly yours,

Larry J. Kane

Enclosure
cc: Howard S. Lewis (w/o encl.)

# ANTIDEGRADATION ANALYSIS AND DEMONSTRATION

## Duke Energy Indiana, Inc.

**Edwardsport Station**
**NPDES Permit Renewal**
**IN0002780**

**June 2010**

**(Revised August 2010)**

# ANTIDEGRADATION ANALYSIS AND DEMONSTRATION

**Duke Energy Indiana, Inc.**
**Edwardsport Station**
**NPDES Permit Renewal**
**IN0002780**

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# ANTIDEGRADATION ANALYSIS AND DEMONSTRATION

**Duke Energy Indiana, Inc.**
**Edwardsport Station**
**NPDES Permit Renewal**
**IN0002780**

## 1 INTRODUCTION

Duke Energy Indiana, Inc. ("Duke Energy") has prepared this Antidegradation Analysis and Demonstration ("Antidegradation Demonstration" or, simply, "Demonstration") in support of the requested renewal of NPDES Permit No. IN0002780 for its Edwardsport Generating Station. The requested permit renewal will include appropriate effluent limitations and other terms and conditions for the Integrated Gasification Combined Cycle (IGCC) electric generation facility under construction on property contiguous to the site of the existing Edwardsport Generating Station. The IGCC station represents a major advance in demonstrated clean coal technology. Notably, its state-of-the-art design will allow the continued use of higher sulfur coals, such as those prevalent in Indiana, without the use of flue gas desulfurization techniques and the high volume of solid waste generated by such techniques, while complying with all requirements of the Clean Air Act. Emission rates of sulfur dioxide and mercury will be markedly lower than for conventional pulverized coal combustion power plants. Moreover, since the plant will gasify rather than combust coal, fly ash will not be generated by the IGCC Station. All regulated air pollutants will be emitted at lower rates per unit of electrical power generated compared to the facility it is replacing. The IGCC station will be rated at 617.7 MW (net capacity) in comparison to the existing station's 160 MW rating.

Treatment systems pushing the bounds of demonstrated and commercially utilized technologies will be applied to wastewaters generated by the IGCC Station to assure that the treated water discharged will comply with all applicable water quality-based effluent requirements. Most wastewater discharges of the existing Edwardsport Generating Station will be terminated concurrently with commencement of operation of the IGCC Station. Among existing discharges to be eliminated is the discharge from the existing ash pond which provides treatment for fly ash transport wastewater. An ash pond will not be needed for the IGCC Station since no fly ash will be generated by its operation. Due primarily to the substantially larger generating capacity of the IGCC Station, when compared to the existing generating station, it will be necessary, notwithstanding the proposed installation of highly advanced wastewater treatment technologies, to discharge certain substances at levels exceeding existing plant discharge levels and ambient background concentrations. Therefore, this Antidegradation Demonstration is provided pursuant to 327 IAC 2-1-2 to justify the proposed discharge under the renewal permit.

## 2 SUMMARY

This Antidegradation Demonstration comprises the following principal topics:

- A brief review and analysis of applicable antidegradation requirements of state and federal law;
- A description of the substances for which limited degradation will result from the proposed discharges;
- A description of the treatment technologies selected by Duke Energy for the wastewaters to be generated by the IGCC station;
- An evaluation of alternative measures available to Duke Energy to minimize or prevent the proposed limited degradation;
- An identification of potential adverse environmental or public health impacts attributable to the proposed limited degradation; and
- A discussion of the positive and negative economic or social development ramifications of the IGCC Station, including benefits to eastern Knox County and surrounding areas.

These topics are drawn from the antidegradation implementation provisions of 327 IAC 5-2-11.3(b)(3) since there are no specific implementation procedures for Indiana waters outside the Great Lakes Basin.

Based on the detailed discussion of these topics provided below, Duke Energy believes that it has adequately demonstrated that the limited degradation of waters of the White River, West Fork is justified and should be approved. Although thirteen substances to be discharged from the IGCC Station are projected to exceed existing water quality levels in the River, all substances will be discharged at concentrations well within water quality-based effluent limitations derived on a site-specific basis for these substances and all existing uses of the River will be sustained and protected with the proposed discharge from the IGCC Station. The treatment technologies and water management techniques to be applied to the wastewaters generated at the Station are among the best applied to electric generation facilities in the nation. Alternative control measures are not feasible or cost-effective. Moreover, the limited degradation in water quality resulting from the proposed discharge from the IGCC Station will be of little, if any, consequence. Finally, the construction and operation of the IGCC Station will have significant economic and social benefits for Knox County and contiguous areas as well as the state of Indiana as a whole.

Duke Energy respectfully requests a decision by the Commissioner of the Indiana Department of Environmental Management (IDEM) approving this Antidegradation Demonstration and the limited degradation of water quality of the West Fork of the White River to result from the discharge of treated wastewaters associated with operation of the Edwardsport IGCC Station.

## 3 ANTIDEGRADATION REQUIREMENTS

Indiana water quality standards applicable to waters outside the Great Lakes Basin include the following antidegradation standard at 327 IAC 2-1-2(2) for high quality waters:

> All waters whose existing water quality exceeds the standards established herein as of February 17, 1977, shall be maintained in their present high quality unless and until it is affirmatively demonstrated to the commissioner

> that limited degradation of such waters is justifiable on the basis of necessary economic or social factors and will not interfere with or become injurious to any beneficial uses made of, or presently possible, in such waters. In making a final determination under this subdivision, the commissioner shall give appropriate consideration to public participation and intergovernmental coordination.

The Indiana Water Pollution Control Board has not adopted rules to guide in the implementation of this antidegradation standard nor has the IDEM adopted nonrule policy documents to provide such guidance.

By its terms, the antidegradation standard of 327 IAC 2-1-2(2) (referred to hereafter as the "Antidegradation Standard") applies to high quality waters, meaning waters with quality better than water quality standards established by 327 IAC 2-1("Rule 2-1"). It is inferred that the high quality of a particular waterbody is determined under the Antidegradation Standard for each substance present in the waterbody on an individual basis.

The term "limited degradation" is not defined within the Antidegradation Standard or in 327 IAC 2-1-9. Certainly a bound on "limited degradation" is the relevant water quality criteria established by Rule 2-1 for protection of the designated uses of a particular waterbody. The Standard provides that limited degradation may not "interfere with or become injurious to any beneficial uses made of, or presently possible" in the waterbody. The most straightforward way to understand degradation for purposes of the Antidegradation Standard is that degradation would occur from a proposed discharge or increase in a discharge to waters that increases the concentration of a substance in those waters over the representative background concentration of the substance. Whether a mixing zone is appropriate for that evaluation would be dependent on the extent to which mixing zones are considered in the application of relevant water quality criteria for the substance as established in Rule 2-1.

Rule 2-1 includes very little guidance on the type and extent of information to be included in a demonstration by the proponent of a new discharge or increase in discharge to waters that is intended to justify a limited degradation that is projected to result from the new or increased discharge. Clearly, information on "economic or social factors" relating to the proposed discharge or increased discharge is germane. Similarly, information on the nature and extent of water quality impact of the proposed discharge or increased discharge is critical. In the absence of formal guidance, a proponent might consider looking to the description of an antidegradation demonstration provided in 327 IAC 5-2-11.3(b)(3) as informal guidance. While this rule provision is not applicable to waters outside the Great Lakes Basin, the general delineation of information that may be considered to justify degradation of water quality may be useful. If this is done, care must be taken to avoid incorporating descriptions of information that are tailored to the different antidegradation standard applicable to waters of the Great Lakes Basin. Another source of potentially relevant guidance can be found in subsections (r), (s), and (t) of IC 13-18-3-2. Although these statutory provisions are expressly applicable only to the proposed degradation of outstanding state resource waters, these provisions may have useful informal guidance for projects affecting other high quality waters.

In this Demonstration, Duke Energy will look to the provisions of 327 IAC 5-2-11.3(b) and IC 13-18-3-2(r) to the extent those provisions offer useful, though informal guidance for the general content and structure of a demonstration.

# 4 THE LIMITED DEGRADATION FROM THE IGCC STATION'S DISCHARGE IS NECESSARY

## 4.1 Wastewater Components of IGCC Station

Wastewaters to be generated by the IGCC Station include: (i) deionization units regeneration flows and other wastewaters resulting from treatment of raw waters drawn from two collector wells for use as make-up water for Station operations; (ii) blowdown from two recirculating cooling water systems to be employed at the Station – one for cooling of the condensers for the heat recovery steam generators and the other for noncontact cooling of certain components of the gasification block; (iii) blowdown from the recirculating grey water used to quench and cleanse synthesis gas exiting the gasifiers; (iv) residual wastewaters from drains and quench operations in the gasification units and power blocks; and various minor flows including, (v) oil/water separator effluent; (vi) sanitary effluent from the on-site wetland treatment system; (vii) storm runoff from coal piles and slag storage areas and other site storm water runoff. Figure 4.1 provides a flow schematic and water balance for the IGCC Station. The treatment systems selected by Duke Energy to address the IGCC Station wastewaters, including but not limited to the advanced treatment system for the grey water blowdown, are described in a subsequent section. Substantial reuse of noncontact cooling waters and certain process wastewaters will be incorporated into the Station's operations to reasonably minimize raw water withdrawal rates and, correspondingly, the wastewater discharge rates.

## 4.2 Description of the Limited Degradation Projected from the IGCC Station Discharge

The proposed discharge from Duke Energy's Edwardsport IGCC Station is projected to result in limited degradation of the West Fork, White River, for the following thirteen (13) substances: ammonia, antimony, beryllium, boron, chloride, chromium, cyanide (total), fluoride, lead, manganese, selenium, sulfate, and thallium.[1] Quantitatively, the amount of limited degradation projected to result from the discharge from the Station is presented in Table 4.2 of this Demonstration. The projected effluent quality for each of the substances listed in the table is based on engineering estimates from evaluation of process operations and effectiveness of proposed Station treatment systems. The existing water quality values for the West Fork of White River against which the projected effluent quality of the Station's

[1] Many of these substances have been discharged at low levels and others are likely to have been discharged by the existing Edwardsport Generating Station. They have not been limited by the NPDES permits previously issued to Duke Energy and its predecessors. Several other substances – arsenic, cadmium, mercury, nickel, silver and zinc, projected to be present in low concentrations in the effluent from the IGCC Station, have been determined to not cause degradation of the White River. Appendices A and B provide a brief description of the bases of this conclusion. As explained in Appendix B, the prospective termination of the ash pond discharge of the existing generating station, which has a greater discharge rate for these substances than will the IGCC Station, will offset their discharge by the IGCC Station, resulting in no degradation.

discharge may be compared are the representative background concentrations for each of the substances as determined by IDEM.

Of those substances for which limited degradation of water quality is projected, several are attributable primarily to their presence in the source water for plant operations, which is derived from two collector wells that are screened in a shallow aquifer hydraulically connected to and recharged by the nearby White River. These substances include antimony, chloride, chromium, fluoride, lead, and manganese. The limited degradation associated with these substances is more apparent than real since they are essentially drawn from river water through the collector wells. Though their projected concentrations in the effluent from the IGCC Station are increased over river levels as a result of being concentrated by the evaporation of recirculating cooling water in the Station's cooling tower, the mass of these substances discharged is essentially unchanged from that contained in the source water intake.

Of the remaining substances, three – ammonia, boron, and cyanide (total) – are predominantly attributable to processes of the IGCC Station. Four other substances – beryllium, selenium, sulfate and thallium – are projected to be contributed from both the intake water and plant processes. For those substances attributable predominantly or substantially to IGCC processes, the principal source of process wastewater contributing these substances is the blowdown from the grey water recirculating system. An optional reuse of the treated grey water blowdown discussed below may slightly affect the concentrations of substances eventually discharged from this wastewater stream.

The limited degradation associated with the IGCC Station discharge from Outfall 002 is described in three different ways in Table 4.2: (i) the effect of the proposed discharge on mixed river concentration of each potentially relevant substance, calculated on the basis of the representative background concentration and the projected effluent quality of the substance; (ii) the amount of increase in mixed river concentration of the substance over the representative background concentration of the substance; and (iii) the projected effluent quality of the substance calculated as a percentage of the preliminarily calculated draft Monthly Average discharge limitation.[2] Based on these methods of displaying the limited degradation posed by the proposed discharge from the IGCC Station, the following observations can be made:

- Of the thirteen substances under evaluation, six – antimony, chromium, lead, fluoride, cyanide (total) and chloride – are projected to increase the mixed river concentration by an amount that is less than or equal to 10% of the representative background concentration ("RBC") and another two – manganese and selenium – are projected to increase the mixed river concentration by 10.8% and 11.7% of the respective RBCs. Moreover, of all eight substances, only one – chloride – has a projected effluent quality (PEQ) greater than 10% of the draft Monthly Average PEL. For chloride, the PEQ is 23.8% of the draft Monthly Average PEL.

[2] The Wasteload Allocation report prepared by IDEM includes preliminary calculations of draft water quality-based effluent limitations for all such substances since they are projected to be present in the discharge. Actual effluent limitations are not proposed for many of these substances in the draft permit since there is no reasonable potential of the effluent to exceed these preliminarily calculated PELs.

- Of the remaining five substances, three – beryllium, sulfate, and thallium – have a projected effluent quality (PEQ) less than 3% of the corresponding draft Monthly Average PEL, and two substances – boron and ammonia – have a projected effluent quality (PEQ) less than 27% of the corresponding draft Monthly Average PEL. Thus, a substantial margin will exist from the draft PEL for each of these substances and the PEL, being based on acute toxicity, has only a localized significance in the immediate vicinity of the outfall. The mixed river concentrations for these substances will provide even greater margins from chronic toxicity criteria.

From these observations, it is fairly concluded that the degradation of water quality to result from the IGCC Station's discharge is truly of a limited nature.

## 4.3 Duke Energy's Selected Wastewater Treatment Methodologies

### 4.3.1 Overview of Station Wastewaters and Selected Treatment System

As described in Section 4.1, above, the types and sources of wastewaters to be generated by the IGCC Station include: (i) regeneration flows from deionization units and other wastewaters from treatment of raw make-up waters drawn from two collector wells; (ii) blowdown from the recirculating cooling water system (including cooling tower cells) for cooling of the condensers for the heat recovery steam generators (HRSGs); (iii) blowdown from the recirculating cooling water system (including cooling tower cells) for noncontact cooling of certain components of the gasification block, such as the radiant syngas coolers; (iv) blowdown from the recirculating grey water used to quench and cleanse synthesis gas exiting the gasifiers; (v) residual wastewaters from drains and quench operations in the gasification units and power blocks and boiler blowdown from the Auxiliary Boiler; (vi) oil/water separator effluent; (vii) sanitary wastewater from Station personnel; (viii) storm runoff from coal piles and slag storage areas; and (ix) other site storm water runoff. As mentioned above, Figure 4.1 provides a flow schematic for the IGCC Station.

Extensive engineering evaluation and design led to the selected methods of wastewater management, treatment, and reuse for the IGCC Station, which are among the best employed in the electric generation industry. The selected wastewater management and treatment system will not only satisfy technology-based requirements of the Clean Water Act, including those specified in 40 CFR Part 423, but also will readily meet anticipated water quality-based effluent limitations for the IGCC Station discharge.

An initial feature of the selected approach is that most process waters used in IGCC Station operations will be reused, to the extent practicably feasible, to reduce water usage and wastewater discharge. Cooling water from condensers for the HRSGs in the power block of the Station, from the Radiant Syngas Cooler in the gasification block, and from certain other plant operations will be reused through several cycles of concentration in the two recirculating systems employing cooling tower cells. Only the blowdown from these recirculating systems will be combined with other wastewaters for discharge. Similarly, grey water used in the

processing of newly generated synthesis gas will be recirculated and reused through several cycles, with blowdown treated in a dedicated pretreatment system prior to reuse in the noncontact recirculating cooling water system for the gasification block or mixing with other wastewaters prior to discharge.

A brief description of the selected treatment methodologies follows.

### 4.3.2 Treatment of Thermal Discharge

The thermal discharge from cooling operations will be controlled and mitigated effectively through the use of cooling tower cells in two recirculating noncontact cooling water systems, as mentioned above. On average, only 1.63 MGD will be blown down from these systems that are designed to recirculate a total of 402 MGD of cooling water. After mixing with other wastewaters in the settling ponds of the IGCC Station, which provide a residence time of 34 days, there will be no appreciable thermal component to the discharge from the Station.

### 4.3.3 Grey Water Blowdown Treatment and Reuse

This section provides a high level overview of the sophisticated thermal evaporative treatment system selected by Duke Energy to treat grey water blowdown from the recirculating grey water process. Before selecting this treatment system design for the grey water, Duke Energy had considered two other alternatives. Initially, it had been planned that the grey water blowdown from the recirculating grey water system would be directly injected underground in deep wells to be permitted under the UIC program. As discussed in Section 4.4, this option was eventually rejected by Duke due to regulatory issues arising under the RCRA hazardous waste program, serious technical feasibility concerns for the contemplated underground injection process, and higher capital costs stemming from the issues associated with the potential technical infeasibility of injection. A second alternative explored by Duke was a treatment system design for the grey water involving physical, chemical, and biological processes. As discussed in Section 4.4, this treatment design was ultimately rejected as likely to be less reliable and substantially more costly than the selected design, while producing effluent of similar quality.

As mentioned, the selected treatment system for the grey water wastestream will utilize an advanced thermal evaporative process to remove, primarily, dissolved and suspended solids from the grey water prior to discharge under an NPDES permit. Details of the treatment process involve proprietary trade secrets of the designer and developer, HPD, and may not be disclosed in this document. It can be generally said that solids removal is primarily accomplished through the use of two proprietary evaporator/concentrator units and two evaporative crystallizer units. The evaporated water, along with residual contaminants, will be recaptured by a series of condensing steps. The condensate will then be subjected to a reverse osmosis (RO) process to further reduce any residual pollutant concentrations. RO reject water will be recycled to the front end of the treatment process. Ammonia will also be substantially reduced through these processes. Finally, a cyanide destruction operation utilizing an alkaline chlorination process will be conducted prior to recycling of the treated grey water to the gasification process cooling system or conveying the treated grey water to

the Station's settling ponds for final polishing and discharge to the river. Solids resulting from the evaporative processes will be concentrated and dewatered for off-site disposal.

As mentioned previously, Duke Energy will normally reuse the effluent from the grey water treatment system as makeup water for the recirculating cooling water system for gasification block components. This is possible since the grey water blowdown will be pretreated to such high quality to enable discharge into the final sedimentation ponds at the IGCC Station that the treated grey water is valuable for reuse as make-up water. The advantage of such reuse is that the rate of groundwater withdrawal in the Station's collector wells can be reduced by roughly 1.08 MGD. The variability of this re-use is dependant upon the volume of grey water blowdown, which in turn is a function of coal quality. The worst case coal quality was assumed when determining contaminant concentrations in and volumes of grey water blowdown. Under normal plant operations in which the treated grey water is reused as make-up water for the gasification block recirculating cooling water system, only a fraction of the treated grey water will be ultimately discharged as a portion of the blowdown from the cooling water system routed to the Station's final settling basins to commingle with other Station wastewaters prior to discharge. However, all residual solid contaminants in the treated grey water will be expected to be discharged with the blowdown since they will be retained in the recirculating system as cooling water is evaporated in the cooling tower. A consequence of the reuse of the treated grey water in this way will be a slight increase in discharge concentrations of substances present in the treated grey water since the concentrations will increase with the number of cycles in the recirculation system. No increase in mass of these substances would occur, however, as a result of the potential reuse. Regardless of such reuse of the treated grey water under normal operations, it is likely to be necessary, during the initial 3 to 5 days following an extended shutdown of one or both of the gasifier units, to discharge the effluent of the grey water treatment system directly to the Southeast Pond and subsequent settling basins since it is necessary to continue operation of the grey water treatment system long enough to process the grey water inputted to the treatment system prior to the shutdown.

### 4.3.4 Treatment of Demineralization and Low Volume Wastewaters

Wastewaters from demineralization and other treatment of raw water, low volume wastes such as oil/water separator effluent and quench and drain waters, treated sanitary wastewaters, site storm runoff, and coal pile and slag storage runoff will be conveyed to a series of settling basins for sedimentation and equalization prior to discharge. Cooling tower blowdown and treated grey water (when not reused ) will also be routed to the settling basins.

### 4.3.5 Sanitary Wastewater

Sanitary wastewater generated at the IGCC Station will be treated in an artificial wetland constructed onsite. The treated effluent from the constructed wetland will be then conveyed to the plant's settling basins.

### 4.3.6 Capital Costs and Operation/Maintenance Costs

The following costs are estimated for the design, installation and ongoing operation and maintenance of the principal components of the water supply and treatment systems selected by Duke Energy for the IGCC Station:

| Component | Capital Cost | O&M Cost (Annual) |
|---|---|---|
| | (in $millions) | |
| Collector wells | 12.70 | 0.25 |
| Service water pretreatment | 67.05 | 2.00 |
| Cooling towers and recirculating system | 32.07 | 2.00 |
| Grey water treatment system | 125.00 | 4.00 |
| Settling basins | 7.06 | 0.14 |
| Sanitary (constructed wetland) | 0.70 | 0.01 |
| **Totals** | **244.58** | **8.40** |

### 4.4 Analysis of Alternative or Enhanced Treatment Techniques

Indiana water quality standards applicable to the West Fork of the White River (327 IAC 2-1) do not contain specifications or guidance for demonstrations to justify limited degradation of high quality waters. Consistent with the analysis in Section 3 of this Demonstration, the antidegradation demonstration provisions of 327 IAC 5-2-11.3(b)(3) are referred to, where reasonably adaptable, as informal guidance in the preparation of this Demonstration. More specifically, 327 IAC 5-2-11.3(b)(3)(a) indicates that an antidegradation demonstration should include an evaluation of alternative or enhanced treatment techniques available to reduce the extent to which degradation is posed by a proposed project. Such a review of alternative or enhanced treatment methodologies is provided in this section. One alternative to be explored under the referenced rule is an evaluation of the feasibility of conveying the proposed discharge to a publicly owned treatment works. Such an approach is not feasible for the IGCC Station since there is no publicly owned treatment works within a reasonable distance and with the capability of accepting the wastewater to be generated by the IGCC Station.

**Option 1 – *Underground injection of grey water blowdown***

An alternative disposition of the blowdown from the recirculating grey water system would be deep well injection via Class 1 injection wells under the Underground Injection Control (UIC) provisions of the federal Safe Drinking Water Act. This alternative was actually the primary approach identified in preliminary planning for the IGCC Station. It would require the construction of several deep wells for injection of the grey water blowdown to subsurface strata from 3,500 to 10,000 feet bgs. The underground injection scenario was eventually rejected as infeasible for two reasons. One, although original projections of grey water constituent levels indicated the grey water would not be characteristic hazardous waste if injected under a UIC permit, subsequent updated estimates of grey water quality indicated that the grey water would be characteristic hazardous waste for arsenic and selenium. Consequently, injection wells would need to be permitted under RCRA as hazardous waste

wells and also under the UIC program. While this option was considered, the level of uncertainty with timing for RCRA permitting and associated costs prevented further pursuit. Failure to make the project commercial by 2013 would mean the loss of $133.5 million in Federal Tax Credits via the 2005 Energy Policy Act.

Two, and perhaps more importantly, geophysical testing of the intended injection zones revealed significantly less porosity than had been anticipated. As a result of the lower porosity, it is probable that many more injection wells would have been required to dispose of the entire volume of grey water blowdown than originally projected. This development also posed negative repercussions for project cost and timing. The original estimate was approximately $40 million for installation of 5 wells and was based on minimum well separation that could be achieved with the property Duke had acquired for the plant site. The addition of several more injection wells to compensate for the lower porosity of the injection zone would have resulted not only in higher well installation costs but also additional property acquisition costs and pipeline costs to feed these remote wells. It was projected that from two to three times the number of wells originally permitted (8) would be needed to provide sufficient injection capacity. Assuming a worst case of 24 wells, the cost of the injection disposal system would have increased to $192 million, based on $6 million per well for drilling and well construction and $2 million per well for infrastructure (well annulus maintenance systems, pumps, tanks, and pipeline) and property acquisition. While the project could have begun with the eight wells originally permitted (putting aside the hazardous waste issues discussed above), the additional time required for property acquisition, permitting, drilling and construction of the additional wells would have had a negative impact on the project schedule. An exact determination of the number of injection wells and their capacity could not have been made until further, detailed geophysical testing was performed.

Based on the regulatory uncertainties, serious technical feasibility concerns, and probable higher capital costs posed for underground injection of the grey water, Duke Energy concluded that installation of a treatment system for the grey water to allow its discharge as part of the NPDES-permitted effluent from the IGCC Station was the preferable course of action. It may be noted that the effluent quality to be produced by the grey water treatment system to enable compliance with water quality-based effluent limitations under an NPDES permit is substantially better than what is required to eliminate hazardous characteristics specified under 40 CFR 261.24.

### Option 2 – *Air cooling of recirculating cooling water*

An alternative method of rejecting heat from the facility which would reduce the thermal component of a discharge from the IGCC Station would be non-contact air cooling. Where reasonably feasible, this method has been utilized in the design of the grey water treatment area of the plant and in the ammonia stripping area of the main plant.

It is conceptually possible to utilize this methodology to provide cooling for the condensers for the HRSG steam turbines and some areas within the gasification process. Such an approach would further reduce water usage and particulate emissions associated with an evaporative cooling tower. However, from a water quality perspective, air cooling offers no discernible advantage over the water-cooled approach selected by Duke Energy. Given the

modest amount of blowdown from the recirculating cooling water systems at the IGCC Station and the subsequent residence time in the final settling basins, the thermal component of the discharge will have little significance. Moreover, there are significant reasons leading to Duke Energy's rejection of air cooling for these applications. One, the capital cost of an air cooled system is estimated to be approximately twice that of an equivalent evaporative cooling tower, resulting in a figure in the range of about $66 million.[3] The markedly higher cost for this application as compared to its use within the grey water treatment system is due to the much higher recirculating water flow rates in the condenser cooling system and the gasification block cooling system. An increase of roughly $34 million in treatment system costs for such minor benefits – an increase of roughly 13.9% in an already very high capital cost for wastewater treatment systems – is decidedly not cost-effective. Two, the overall station efficiency would be reduced due to higher condensing and cooling temperatures. The Indiana climate is not conducive to this type of cooling technology. Three, the net electrical output of the IGCC Station would be reduced by nearly 2.7% or nearly 17 MW, the amount of power estimated to be needed to operate an air cooling system.[4] This assessment is based on an evaluation of this type of condenser cooling system by other electric generating facilities.

**Option 3**: ***Grey water blowdown treatment by physical/chemical/biological processes***

An alternative preliminarily considered by Duke Energy to the thermal evaporation and crystallization of the grey water blowdown would be to treat the grey water blowdown wastestream with physical, chemical, biological, and membrane technologies. An engineering evaluation by Duke and its consultants concluded that such a treatment approach would require a complex series of more than 22 different process steps. Each of these steps would add the possibility for upset or operational problems, leading to a conclusion that such a treatment alternative will be less reliable than the selected treatment approach. Moreover, this system would have similar effluent water qualities, but would result in additional air emissions and solid wastes when compared to the selected thermal evaporative treatment system. The capital costs of the alterative methodology are estimated to approach $190 million vs. $125 million for thermal evaporative treatment. This would represent an increase in capital cost for this treatment system component alone of 52% and an increase of 26.6% in the overall capital cost of all wastewater treatment systems for no recognizable benefit. Moreover, the chemical reagent portion alone of the O&M costs for the alternative system would be projected to approach $11 million per year, while the selected grey water treatment system has projected costs for chemical treatment additives approaching $2.5 million per year. Thus, ample reasons exist for rejection of this treatment alternative option for the grey water blowdown.

## 4.5 Conclusions

[3] See NPDES Application for American Municipal Power Generating Station, submitted by American Municipal Power-Ohio, Inc. (April 2007) submitted to Ohio Environmental Protection Agency, Antidegradation Study, pp. 16-17. The air cooled system for condenser cooling evaluated by AMP-Ohio was projected to cost $100 million to address condenser cooling needs for a generating facility rated approximately 50% larger than the Edwardsport IGCC Station.

[4] *Id.*

All of the alternative or enhanced treatment options were appropriately rejected for technical and/or cost reasons. Preliminarily, conveyance of Station wastewaters to a POTW was not feasible. Option 1, the underground injection of grey water blowdown, was inordinately expensive and suffers from technical feasibility concerns. The use of air cooling in the larger recirculating cooling water systems at the Station, Option 2, was rejected for inordinate cost, lack of water quality benefit, and significant penalty to net electrical power output from the Station. Finally, Option 3, the use of physical/chemical and biological treatment methods for the grey water blowdown, was discarded as markedly more costly, less reliable, and offering no water quality benefit.

As a result, it is concluded that the limited degradation of water quality of the White River projected to result from the discharge of Station wastewaters, after application of the selected wastewater management and treatment methodologies, is necessary. In view of this and other information contained in this Demonstration, Duke Energy submits that the limited degradation should also be determined to be justified.

# 5 ADVERSE WATER QUALITY IMPACTS FROM THE IGCC STATION'S DISCHARGE WILL NOT BE SIGNIFICANT

## 5.1 Background

Indiana water quality standards applicable to the West Fork of the White River (327 IAC 2-1) do not contain specifications or guidance for demonstrations to justify limited degradation of high quality waters. Consistent with the analysis in Section III, the antidegradation demonstration provisions of 327 IAC 5-2-11.3(b)(3) are referenced as informal guidance in the preparation of this Demonstration. More specifically, the following information is provided in support of this Demonstration, based on reference to 327 IAC 5-2-11.3(b)(3)(C):

An evaluation has been performed of the ***potential adverse environmental or public health impacts*** attributable to the proposed limited degradation. This evaluation is summarized in the following sections.

## 5.2 Potential Impact of the Limited Degradation on the Aquatic Community Structure and Function

Any impact of the proposed limited degradation of White River water quality on the river's aquatic community will be insignificant and, with respect to most substances, nearly imperceptible. First, and most importantly, the projected effluent quality of the discharge from the IGCC Station will be compliant with all water quality-based effluent limitations for applicable water quality criteria based on protection of a well-balanced aquatic community. This assures that the proposed discharge will not interfere with or adversely affect the aquatic community present in the White River.

Second, the projected effluent quality of the Station's undiluted discharge is within the same order of magnitude as the representative background quality for all but a few of the substances

for which limited degradation is projected. This observation supports a conclusion that the discharge, with respect to all substances, will generally have little effect on existing ambient quality of the river. This can be more readily seen from comparing the mixed downstream concentration of these substances with the representative background concentrations as discussed above in section 4.2. As a result, it can be even more firmly concluded that the limited degradation posed by the proposed Station discharge will not have an adverse impact on the affected aquatic community.

The West Fork of White River is open to commercial fishing in the vicinity of the Edwardsport Station. The majority of the catch, by weight, comes from channel catfish and flathead catfish. Carp and buffalo are next in importance by weight. Important recreational species include striped bass, smallmouth bass, and largemouth bass. However, this portion of the West Fork of the White River is only lightly used for recreational fishing. There are no known mussel beds in this reach of the White River. Based on the conclusions applicable to the aquatic community as a whole stated above, Duke Energy does not anticipate any adverse impacts on any species referenced in this paragraph as the subject of commercial or recreational fishing.

### 5.3 Endangered or Threatened Species Potentially Impacted

There are no records of any endangered or threatened aquatic species associated with the West Fork of White River in the vicinity of the Edwardsport Station, based on available sampling data.

### 5.4 Any Increased Risks to Human Health due to New or Increased Concentration of Carcinogens Are *De Minimis*

Among the substances projected to be discharged from the IGCC Station at levels producing limited degradation, beryllium and lead are identified by IDEM in its Wasteload Allocation Report as probable or known carcinogens. Of these, EPA has established a human health cancer-related water quality criterion only for beryllium, classified as a known carcinogen. The IGCC Station discharge is projected to contain beryllium at a concentration of 0.7 ug/l,[5] which is calculated as less than 0.5% of the draft Monthly Average PEL. With this discharge level, the mixed river concentration is projected to increase to 0.04 ug/l, which is only 3.4% of the human health cancer-related water quality criterion for beryllium. Lead is referenced in the EPA's IRIS database as a probable carcinogen; however, no human health criteria have been established. The proposed discharge of lead is projected to increase the mixed river concentration by 2.7% over the representative background concentration. The projected discharge concentration for lead is only 1.1% of the draft Monthly Average PEL. No BCC is projected to be discharged at a level so as to cause limited degradation. It is concluded that any increased risks to human health associated with the proposed discharge of these substances are *de minimis*.

### 5.5 There Are No Unique or Rare Characteristics of the Receiving Waterbody within the Locality or State that Are Potentially Impacted

[5] The term "ug/l" is an abbreviation for micrograms per liter, which is a unit equivalent to parts per billion.

Duke Energy is not aware of any unique or rare characteristic pertaining to the West Fork, White River within the area of or downstream of the Edwardsport locality, much less one that would be potentially affected by the proposed limited degradation.

### 5.6 There Are No Potential Impacts on Downstream Public Water Supply Intakes

The proposed discharge from the IGCC Station is not anticipated to have any effect on downstream public water supply intakes. There are no public water supply intakes located on the West Fork of the White River downstream of Edwardsport nor are there any such intakes on the White River after the confluence of the East and West Forks.

### 5.7 Other Environmental Permits that Duke Energy Has Applied for or Will Apply for in relation to the Construction or Operation of the IGCC Station

In addition to the pending application for renewal of its NPDES permit, Duke Energy has applied for the following environmental permits to support the construction and/or operation of the Edwardsport IGCC Station: Significant Source Modification Approval No. T-083-23529-00003 [PSD preconstruction permit], issued by IDEM's Office of Air Quality on January 25, 2008; Part 70 Significant Permit Modification No. T083-23531-00003, issued by IDEM's Office of Air Quality on March 11, 2008; Significant Source Modification Approval No. T-083-23683-00003 [revision to PSD permit], issued by IDEM's Office of Air Quality on March 1, 2010; and Part 70 Significant Permit Modification No. T083-28801-00003, issued by IDEM's Office of Air Quality on April 20, 2010. In addition, Duke Energy applied for and received UIC permits from U.S. EPA for Class I test wells to investigate the characteristics of subsurface strata related to possible injection of certain waste materials from the Station.

### 5.8 Conclusions

There are no significant adverse environmental or public health impacts associated with the proposed limited degradation of water quality to result from the IGCC Station discharge.

## 6 The Limited Degradation from the IGCC Station Will Support Important Economic or Social Development

### 6.1 Background

Indiana water quality standards applicable to the West Fork of the White River (327 IAC 2-1) do not contain specifications or guidance for demonstrations to justify limited degradation of high quality waters. Consistent with the analysis in Section III, the antidegradation demonstration provisions of 327 IAC 5-2-11.3(b)(3) are referenced as informal guidance in

the preparation of this Demonstration. More specifically, the following information is provided in support of this Demonstration, based on reference to 327 IAC 5-2-11.3(b)(3)(B):

An evaluation has been performed of the ***positive and negative social or economic development ramifications and the benefits to the area*** in which the waters are located that will occur if limited degradation is allowed. This evaluation can be summarized as follows:

### 6.2 Anticipated Positive Economic Impacts Attributable to the Construction and Operation of the Edwardsport IGCC Station

A. The Edwardsport IGCC Station represents a significant economic development project, not only for the local economy in Knox County and the surrounding area, but also for the future state and national economies. Although the issue has been temporarily muted somewhat by the current recession, a critical issue confronting the nation is the need to reduce dependence on foreign energy sources, such as crude petroleum. Given that coal is the most abundant fossil fuel present in the United States, it is important to develop refined technologies for utilizing coal while minimizing air pollutant emissions. The Edwardsport IGCC Station provides cutting edge clean coal technology to meet this objective. The gasification process to be utilized in the Edwardsport IGCC Station will employ several process steps to remove sulfur, mercury, particulates, and, to a lesser extent, nitrogenous compounds from raw synthesis gas ("syngas"). The combustion turbines to be employed are the first of a new generation of turbines designed to operate more efficiently on syngas. The high rate of sulfur removal from raw syngas is especially important for enhancing the usability of bituminous coal from the eastern United States in compliance with Clean Air Act requirements without the necessity of highly expensive and otherwise unattractive flue gas desulfurization systems. Most other air pollutant emissions from the IGCC Station are projected to be substantially reduced in comparison to conventional pulverized coal combustion steam electric generating plants. Mercury will be reduced to very low levels compliant with New Source Performance Standards and expected to be compliant with any heath-based emission standards that may be adopted by EPA in lieu of the invalidated Clean Air Mercury Reduction (CAMR) rule.

With respect to the general impact on the state economy, the ability of the Edwardsport IGCC Station to utilize high sulfur Indiana coal will have a salutary effect on Indiana's coal industry and, thus, the economy of the southwestern area of the state. Further, the IGCC Station is the first baseload electric generation plant constructed in the state in roughly 30 years and will be a key part of the state's ability in future decades to support the manufacturing sector upon which the state economy is highly dependent. The IGCC Station will generate 617.7 MW net electrical power for baseload use, compared to the existing Edwardsport Generating Station's rated generating capacity of 160 MW.

B. Construction and operation of the Edwardsport IGCC Station will provide substantial economic benefits to local economies in Knox County and other nearby counties, most of which are characterized by higher unemployment rates and lower household incomes in comparison to other parts of the state.

*Construction-related Benefits.* In the shorter term, substantial economic benefits attend the construction of the IGCC Station. Overall capital cost of the IGCC Station is currently projected at $2.88 billion, representing one of the more substantial development projects of the past decade in Indiana. Construction activities began in 2008 and will continue through much of 2011. These activities are estimated to provide approximately 1,300 direct construction jobs and to induce an additional 424 indirect jobs. Based on conservative estimates of wage levels at nearly $36,000 annually per worker, on average, not including fringe benefits, these jobs will produce total annual wages of approximately $62 million. Moreover, the total economic impact of plant construction is projected at roughly $142 million during each year of construction.[6]

*Operations-related Benefits.* When operation of the Edwardsport IGCC Station commences, it is currently projected that approximately 120 to 130 persons will be employed in plant operations. This represents a substantial increase over the approximately 40 persons employed at the existing Edwardsport Generating Station. Many of these positions will be highly technical and require post-secondary education. Plant operations are also expected to generate 221 additional support jobs in Knox County. At average estimated wages of $63,000 annually, total wages for the jobs created by plant operations is projected at roughly $22 million annually. Total economic benefit to Knox County from IGCC Station operations would be expected to exceed $143 million annually.[7]

While a substantial portion of plant employees will be drawn from other Duke Energy facilities or from outside the local area, many employees are anticipated to originate from Knox, Daviess, and Greene Counties, and some from as far as Vanderburgh and Vigo Counties. Jobs of the caliber and wage level to be provided at the IGCC Station are uncommon in Knox and surrounding counties.

Income levels in Knox County are among the lowest in the State of Indiana. In contrast to the projected average wage of $63,000 for the IGCC station employees, the average wage per job in Knox County in 2008 was just $30,457 ranking 66th of the 92 Indiana counties. The median household income for Knox County in 2008 was just $39,509 ranking 85th of all Indiana counties. The median household income in Knox County declined by 2.6% from 2000 to 2008. The 2008 poverty rate in Knox County was 16.6% - the 11th highest rate in the state.

The population in Knox County has declined by 5% since 1990. By comparison, during the same period, Indiana's population has grown by 15.9%. Knox County's population growth ranks 83rd of all Indiana counties. The Indiana Business Research Center projects the population decline in Knox County to continue through 2025. The population decline is likely the result of a lack of quality jobs in the county.

[6] The source for these estimates is Memorandum of Michael Hicks, Ph.D., Center for Business and Economic Research, Miller College of Business, Ball State University (March 25, 2010).
[7] *Id.*

The following table lists these and other key demographic information comparing Knox County, the region containing Knox County and five adjacent counties, and the State of Indiana.

| | Knox County | Knox & Adjacent Counties | Indiana |
|---|---|---|---|
| Average Wage per Job (2008) | $30,457 | $34,231 | $38,403 |
| Median Household Income (2008) | $39,509 | $40,020 | $47,966 |
| Labor Force (2008) | 16,747 | 59,457 | 2,872,442 |
| 10-year Change in Labor Force (1998-2008) | -2.9% | 8.0% | 0.8% |
| Population Growth since 1990 | -5.0% | 3.7% | 15.9% |
| Population Growth since 1980 | -9.3% | 4.9% | 17.0% |
| Poverty Rate (2008) | 16.6% | 13.6% | 12.9% |

The data clearly show that the economic conditions in the area surrounding the Edwardsport IGCC Station lag well behind than the rest of the state. Thus, the jobs to be created at the IGCC Station and the additional, indirect jobs to be induced in the area as a result of IGCC Station operations will provide a definite economic benefit to this economically depressed area of the state.

### 6.3 Anticipated Negative Economic Impacts Attributable to the Construction and Operation of the Edwardsport IGCC Station

Construction and operation of the Edwardsport IGCC Station is not expected to result in any potential negative economic or social impacts to Knox County or other nearby areas, including but not limited to the near downstream area. As discussed above, the projected effluent quality from the IGCC Station will not have an appreciable impact on existing quality of the White River, West Fork. Consequently, the project should not affect recreational uses of the river or tourism revenues associated with the river or other features in the area.

### 6.4 Conclusions

The Edwardsport IGCC Station represents an important economic development project for the locality, state and nation in that it will showcase a new generation of clean coal technology that enables the use of high sulfur coal reserves, an abundant natural energy resource, while concurrently reducing air emissions in compliance with Clean Air Act mandates, as well as substantially reducing solid waste generation. Construction of the IGCC Station is projected

to provide about 1,300 direct construction jobs and to induce another several hundred indirect jobs, producing total annual wages of approximately $62 million. Operation of the IGCC Station is currently expected to require employment of 120 – 130 full-time employees and to induce creation of another 221 support jobs in nearby areas, which are among the more economically depressed in the state. Total economic benefit to the surrounding area from IGCC Station operations is estimated to exceed $143 million annually. No significant negative economic impacts on water quality-related uses or activities associated with the White River are expected to result from operation of the IGCC Station

## 7 OVERALL CONCLUSIONS

Based on the foregoing information, the following conclusions are warranted:

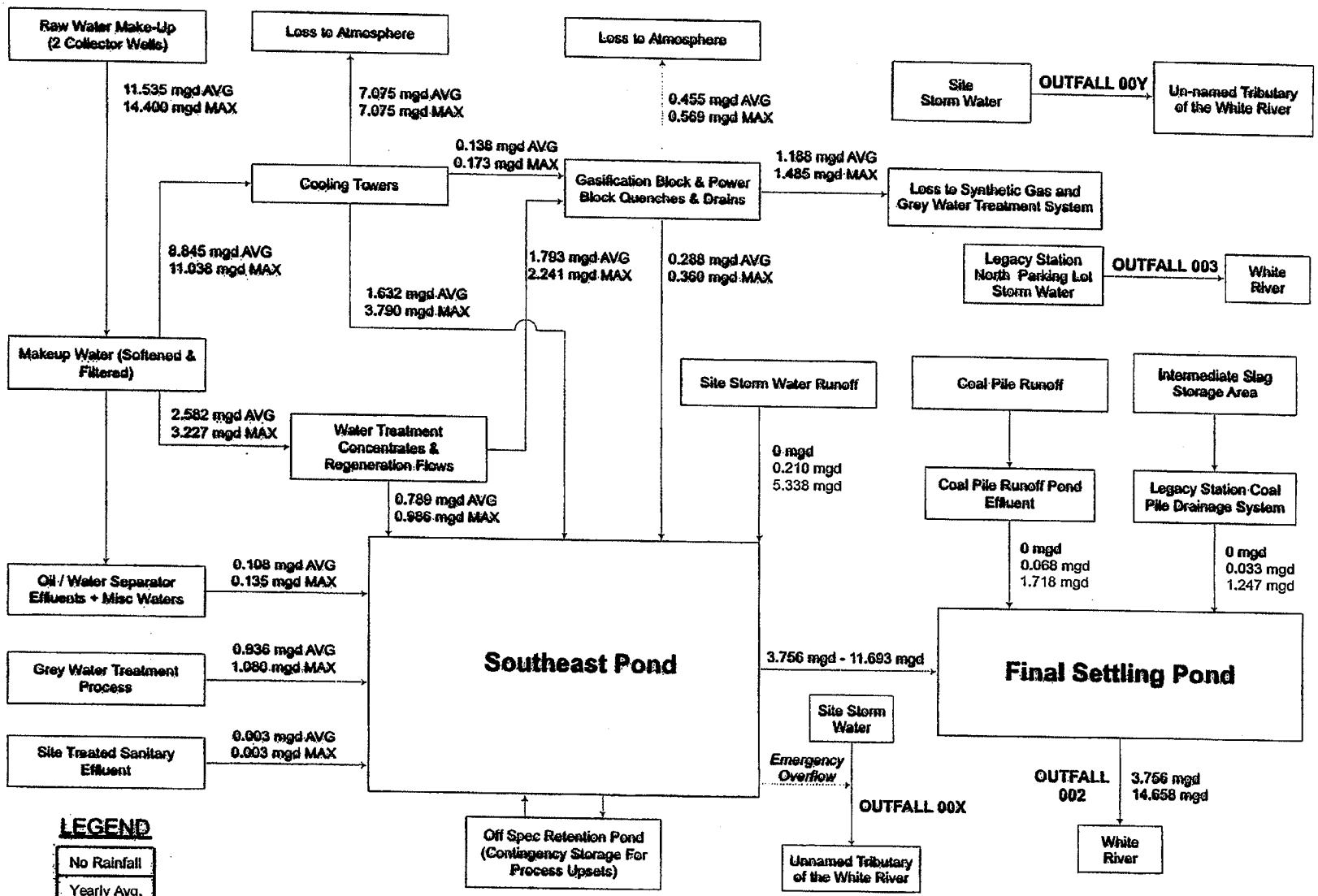
(1) the projected effluent quality from Duke Energy's Edwardsport IGCC Station will readily comply with all applicable technology-based and water quality-based effluent limitations and will not interfere with or be injurious to any beneficial uses made of, or presently possible, in the West Fork of White River downstream of Edwardsport, Indiana;

(2) there are no cost-effective treatment methodologies readily available or technically or economically feasible that would prevent the limited degradation to the West Fork of the White River proposed by Duke Energy in conjunction with the operation of its Edwardsport IGCC Station;

(3) the limited degradation projected to the water quality of the White River, West Fork, as a result of IGCC Station operations is necessary for development and operation of the IGCC Station and is not expected to pose any significant adverse environmental or public health impacts; and

(4) the construction and operation of the IGCC Station will support necessary economic or social developments in the area of the Station and in the State of Indiana.

Duke Energy respectfully requests approval of this Antidegradation Demonstration and the projected limited degradation of water quality, in conjunction with issuance of a renewal NPDES permit for the Edwardsport Station.




**Duke Energy Indiana, Inc.**
**Edwardsport IGCC Station**
**Form 2C Line Drawing**

Figure 4.1

## Table 4.2 Substances Projected to Result in Limited Degradation

| Substance | River[1] (Represent. Background Conc.) | Form 2C (PEQ) | IDEM[2] Draft PEL | | Mixed River Concentration. (incl. PEQ) | Increase in River Conc. | PEQ as % of Avg. PEL |
|---|---|---|---|---|---|---|---|
| | | | Monthly Avg | Max | | | |
| Antimony | 0.66 ppb | 2.5 ppb | 720 ppb | 1,400 ppb | 0.71ppb | 0.05 ppb | 0.4% |
| Beryllium | 0.02 ppb | 0.70 ppb | 150 ppb | 360 ppb | 0.04 ppb | 0.02 ppb | 0.5% |
| Boron | 132 ppb | 5955 ppb | 30000 ppb | 60000 ppb | 425.5 ppb | 293.5 ppb | 19.8% |
| Chromium | 1.7 ppb | 4.3 ppb | 3678 ppb[3] | 7380 ppb[3] | 1.77 ppb[4] | 0.07 ppb[4] | 0.1% |
| Lead | 1.5 ppb | 2.8 ppb | 250 ppb | 510 ppb | 1.54 ppb | 0.04 ppb | 1.1% |
| Manganese | 52 ppb | 248 ppb | 2500 ppb | 5100 ppb | 57.6 ppb | 5.6 ppb | 9.9% |
| Selenium | 1.2 ppb | 6.0 ppb | 130 ppb | 260 ppb | 1.34 ppb | 0.14 ppb | 4.6% |
| Thallium | 0.026 ppb | 2.3 ppb | 86 ppb | 170 ppb | 0.09 ppb | 0.064 ppb | 2.7% |
| Fluoride | 0.27 ppm | 1.05 ppm | 12 ppm | 24 ppm | 0.29 ppm | 0.02 ppm | 8.8% |
| Total Cyanide | 0.01 ppm* | 0.044 ppm | 1700 ppm | 4100 ppm | 0.011 ppm | 0.001 ppm | 0.0026% |
| Ammonia | 0.05 ppm | 3.15 ppm | 12 ppm | 24 ppm | 0.129 ppm | 0.079 ppm | 26.3% |
| Chloride | 56 ppm | 205 ppm | 860 ppm | 1700 ppm | 60.2 ppm | 4.2 ppm | 23.8% |
| Sulfate | 62 ppm | 648 ppm | 47000 ppm | 94000 ppm | 78.6 ppm | 16.4 ppm | 1.4% |

All metals are stated as total concentration unless otherwise indicated

[1] IDEM data from Fact Sheet (except where otherwise indicated by * )

[2] IDEM Fact Sheet

[3] as Chromium III

[4] assuming background and discharge is Chromium III

## APPENDIX A

**Determination that No Degradation Will Be Caused by the Discharge of Mercury from Duke Energy Indiana, Inc.'s Edwardsport IGCC Station**

There are two independent bases for the determination that the IGCC Station being constructed at Edwardsport will not cause degradation of water quality for mercury in the West Fork of the White River and that, therefore, an Antidegradation Demonstration is not required for the proposed discharge of mercury under 327 IAC 2-1-2(2).

### I. The Projected Effluent Quality of Mercury from the IGCC Station Will Be Less than the Representative Background Concentration in the White River

This determination is based on a projection of the mercury content of the wastewater to be discharged from Outfall 002, based on a calculation of the mercury sources for the wastewater ultimately discharged and a conservative assumption that all mercury contributed by these wastewater sources will be discharged. The two sources of mercury in the wastewaters to be generated by IGCC Station operation are (i) the raw water withdrawn from the two collector wells for the Station or (ii) from the coal that is inputted to the gasification process.

- Raw water's mercury content

Sampling of water withdrawn from the two collector wells during hydraulic testing of the wells at full production rate has been performed since November 2009. 20 samples have been taken from Collector Well No. 1 and 14 samples have been taken from Collector Well No. 2, for a total of 34 samples, all collected and analyzed using Method 1631, Revision E. All but two sample results were non-detectable using this methodology. Since the limit of quantification for the method is 0.5 ng/l, the non-detectable samples have been quantified as < 0.5 ng/l. Using this approach, the long-term average mercury content of the raw water from the collector wells is calculated as < 0.524 ng/l.

The long-term average flow rate for raw water input to the IGCC Station, as taken from the line diagram for Station wastewater flows included in the NPDES permit renewal application for the Edwardsport Station, is 7,991 gpm (11.535 MGD).

- Grey Water Blowdown from the Gasification Process

The process water generated by the gasification process at the IGCC Station is the blowdown from the recirculating grey water system. The long-term average design flow of grey water blowdown is 650 gpm (0.936 MGD) and the projected maximum flow rate of the blowdown is 750 gpm (1.08 MGD). The grey water blowdown will be treated in a dedicated treatment system incorporating evaporative processes and RO polishing. The mercury concentration of the treated effluent of the grey water treatment system will not exceed 8.5 ppt according to specifications of the equipment supplier. Thus, the mercury input to the final Station wastewater is based on 8.5 ng/l from the grey water treatment system.

- ***Scenario 1 – Treated Grey Water Blowdown Discharged Directly to the Southeast Pond***

The following scenario describes the situation in which the treated grey water blowdown is discharged directly to the Southeast Pond. To be conservative, the calculation of projected mercury concentration of the overall effluent from Outfall 002 is based on the maximum flow rate from the grey water treatment system of 1.08 MGD. A further conservatism is employed by using the long-term average flow rate for raw water input to plant processes (11.535 MGD) adjusted only for the 100 gpm increase for the maximum rate of grey water blowdown, which results in a raw makeup water flow of 11.679 MGD.

The calculation sums the total mercury input to the final wastewater and then divides by the corresponding flow rate (3.756 MGD adjusted for additional 0.144 MGD for maximum grey water flow rate) from the Southeast Pond to obtain the projected effluent concentration of mercury:

$$\frac{\{11.679 \text{ MGD (raw water)} - 1.080 \text{ MGD (grey water)}\} \times (0.524 \text{ ng/l}) + \{1.080 \text{ MGD (grey water)} \times 8.5 \text{ ng/l}\}}{3.900 \text{ MGD}}$$

= 3.78 ng/l (as total mercury).

- ***Scenario 2 – 0.936 MGD of Treated Grey Water Blowdown Is Reused as Makeup Water in the Gasification Block Cooling System***

A more conservative projection is calculated to address the situation in which 0.936 MGD of treated grey water is recycled for reuse as makeup water for the recirculating cooling water system for the gasification process. The remaining 0.144 MGD of treated grey water is not reused and is directly discharged to the Southeast Pond. Under this scenario, the flow rate from the Southeast pond and thus Outfall 002 is reduced by 0.936 MGD – the amount of treated grey water that would not be discharged but would instead displace 0.936 MGD of raw makeup water for the recirculating cooling water system. This has the effect of reducing the raw water input by 0.936 MGD.

The equation for determining the mercury effluent concentration under this water use scenario is as follows:

$$\frac{[\{11.679 \text{ MGD (raw water)} - 0.936 \text{ MGD (grey water re-use)}\} - 1.080 \text{ MGD (grey water)}] \times (0.524 \text{ ng/l}) + [1.080 \text{ MGD (grey water)} \times 8.5 \text{ ng/l}]}{3.900 \text{ MGD} - 0.936 \text{ MGD}}$$

= 4.80 ng/l (as total mercury).

The reason for the higher mercury concentration of the Outfall 002 discharge is primarily the lower discharge rate in the denominator of the equation.

- Representative Background Concentration of Mercury

Upstream water quality for mercury in the West Fork of the White River has been sampled and analyzed by Duke Energy for the same time period that sampling of the collector wells has been conducted. A total of 20 samples to date have been taken and analyzed.

The representative background concentration of mercury, as determined by calculating a geometric mean of the data set, is:

6.36 ng/l.

- No Degradation of Water Quality Is Posed by the Projected Discharge Quality

By comparing the higher of the two projections of effluent mercury from the IGCC Station operations, 4.80 ng/l, to the representative background concentration of 6.36 ng/l, it is determined that the IGCC Station's operation will not cause degradation of the water quality of the White River.

## II. The Projected Effluent Quality of Mercury from the IGCC Station Will Be Lower in Concentration than that Historically Present in the Existing Discharge from the Edwardsport Generating Station

The second basis for determining that the projected discharge of mercury from the IGCC Station will not cause degradation is that the projected concentration of mercury in the discharge from Outfall 002 will be less than the historical concentration of mercury in the ash pond discharge from the existing Edwardsport Generating Station. The existing discharge at Outfall 002 from the ash pond is the appropriate discharge for purposes of comparison with the IGCC Station's discharge from Outfall 002 since they each comprise all process and quasi-process wastewaters from their respective facilities and the existing ash pond discharge will be replaced in its entirety by the IGCC Station discharge. Existing Outfall 001, the discharge of high volumes of once-through noncontact condenser cooling water, has no counterpart at the IGCC Station and will no longer occur once the IGCC Station commences operation.

Mercury monitoring of the Outfall 002 discharge, using Method 1631, Revision E, has been required on a bimonthly frequency under the existing NPDES permit since November 2006. The long-term average of the monitoring results is 7.9 ng/l, which is significantly higher than the projected mercury discharge concentration from the IGCC Station. Moreover, the historical flow rate of the ash pond discharge (Outfall 002) of the

existing Edwardsport Station is approximately 50% higher than the projected flow from the IGCC Staton. Thus, the mercury concentration and mass of the projected discharge from the IGCC Station will be less than the historical discharge level from the existing Edwardsport Generating Station. Moreover, the existing Outfall 002 discharge will have ceased by the time discharge from Outfall 002 under IGCC Station operations has commenced. In conclusion, no degradation of the White River is posed by the proposed IGCC Station discharge.

As a further point, it is observed that, although no effluent limitations have been established in the NPDES permit for the existing generating station at Edwardsport, there is no reason to expect that, had a water quality-based effluent limit been established, it would have been any different from that proposed for the IGCC Station.

**Summary of Pertinent Mercury Data**
**For Proposed IGCC Station Discharge**

| Representative Background Conc. | Historical Discharge Existing Ash Pond | Projected Effluent Quality – IGCC Station |
|---|---|---|
| 6.36 ng/l | 7.9 ng/l | 4.8 ng/l* |
| | | |

*Worse case value for the two scenarios examined.

## APPENDIX B

**Determination that No Degradation Will Be Caused by the Discharge of Arsenic, Cadmium, Nickel, Silver and Zinc from Duke Energy Indiana, Inc.'s Edwardsport IGCC Station**

This appendix documents the rationale for determining that the IGCC Station being constructed at Edwardsport will not cause degradation of water quality for arsenic, cadmium, nickel, silver and zinc in the West Fork of the White River and that, therefore, an Antidegradation Demonstration is not required for the proposed discharge of these substances under 327 IAC 2-1-2(2).

### The Projected Effluent Quality of These Substances from the IGCC Station Will Be Better than the Historical Discharge Quality from the Existing Generating Station

The projected discharge of five metals - arsenic, cadmium, nickel, silver and zinc – from the IGCC Station will not cause degradation in the White River since: (i) the projected effluent quality of each of these substances in the discharge from Outfall 002 of the IGCC Station will be less than the corresponding historical concentrations of these same substances in the ash pond discharge from Outfall 002 at the existing Edwardsport Generating Station, and (ii) the flow rate of the existing ash pond discharge has historically been greater than that projected for the discharge from the IGCC Station.[1] Since the existing ash pond discharge will cease with the startup of operations of the IGCC Station, the projected discharge of these substances from the IGCC Station will not cause an increase in mixed river concentration. The existing discharge at Outfall 002 from the ash pond is the appropriate discharge for purposes of comparison with the IGCC Station's discharge from Outfall 002 since they each comprise all process and quasi-process wastewaters from their respective facilities and the existing ash pond discharge will be replaced in its entirety by the IGCC Station discharge. Existing Outfall 001, the discharge of high volume once-through noncontact condenser cooling water, has no appreciable net effect on the concentrations of these metals in the White River and has no counterpart at the IGCC Station.

Monitoring of the existing Outfall 002 discharge for the five metals has been required on a twice monthly frequency under the existing NPDES permit for a twelve month period

[1] A sixth metal, selenium, also has a projected effluent quality less than the historical concentration in the ash pond discharge from the existing generating station. However, the PEQ for selenium is close enough to the historical discharge concentration that the small increase in discharge concentration from the IGCC Station that is expected if the treated grey water wastestream is reused as makeup water for the recirculating cooling water system (for the gasification process) would raise the PEQ above the historical discharge concentration. Therefore, given this possible result, selenium has been retained in the Antidegradation Demonstration as a conservative measure. However, it may be noted that, even under the option in which the grey water treatment effluent is reused in the recirculating cooling system, the mass of selenium projected to be discharged from the IGCC Station is less than that historically discharged from the existing generating station. Thus, as a technical matter, no increase in river concentration of selenium is projected as a result of the operation of the IGCC Station.

beginning December 2008. The table below (Table - App. B) summarizes the results of the monitoring of these substances. This table displays the long-term average of the monthly average results for each substance. Duke Energy believes use of the monthly average data is a conservative basis for comparison with the projected effluent quality (PEQ) for the discharge of each substance from the IGCC Station. As can be seen from this table, for each of the five substances, the long-term average of the monthly average concentrations of monitoring results from the existing ash pond at the Edwardsport Generating Station is greater than the PEQ concentration for each substance in the IGCC Station's discharge. Moreover, as stated above, not only are the concentrations of the existing facility's discharge of these substances greater than the corresponding projected effluent concentrations of the same substances in the IGCC Station discharge, but the mass discharge of each pollutant from existing Outfall 002 is greater than the mass discharge of that pollutant as projected from the IGCC Station since the flow rate of the existing discharge is roughly 50% higher than the projected flow rate from the IGCC Station. Thus, the projected discharge from the IGCC Station will be less than the historical discharge level from the existing Edwardsport Generating Station for each of these five substances on a mass basis as well as a concentration basis. Moreover, the existing Outfall 002 discharge will have ceased by the time discharge from Outfall 002 under IGCC Station operations has commenced. Thus, no degradation of the West Fork of the White River is posed by the IGCC Station discharge with respect to these substances.

As a further point, it is observed that, although no effluent limitations have been established for these five substances in the NPDES permit for the existing generating station at Edwardsport, there is no reason to expect that, had water quality-based effluent limits been established, they would have been any different, on a concentration basis, from those proposed for the IGCC Station.

**Table – App. B**

**Additional Substances in IGCC Station Discharge**
**Projected to Not Cause Degradation**

| Substance | Existing Ash Pond | IGCC Station Outfall 002 |
|---|---|---|
| (all data in mg/l) | Long-term Average of Monthly Averages | PEQ |
| Flow (MGD) | 5.75 | 3.76 |
| Arsenic | 0.049 | 0.0112 |
| Cadmium | <0.002[2] | 0.0006 |
| Nickel | 0.013 | 0.0086 |
| Silver | <0.007[3] | 0.0016 |
| Zinc | 0.061 | 0.0346 |

[2] Two individual values at 0.002 mg/l; all other data < 0.002 mg/l
[3] One individual value at 0.007 mg/l; all other data < 0.007 mg/l

Duke Energy Indiana, Inc.

Response to IDEM's Request for Supplemental Information
concerning the Antidegradation Demonstration:

1. Please elaborate on the cost-effective changes in process technologies and raw materials that might further reduce or eliminate the new or increased discharge such as using higher quality low sulfur coal.

   Response:

   Duke Energy is unaware of any cost-effective changes that could be made to process technologies or raw materials to further reduce constituents in the treated grey water. As pointed out in Section 4.1 of the Antidegradation Demonstration, the grey water results from the use of water for contact cooling and scrubbing of the raw synthesis gas as it leaves the gasifier and radiant syngas cooler. Scrubbing removes solids entrained with the raw syngas. The process already provides for the recycling of the grey water within this cooling/scrubbing process as intensively as possible until residual constituents removed during the process accumulate to levels that would compromise metallurgy and impact grey water treatment system effectiveness. A blowdown from the recirculating grey water system is provided to allow the system to operate effectively. The blowdown from the recirculating grey water system is directed to the grey water treatment system. The constituents in the grey water are inherently present as a result of their trace presence in the coal that is the raw material to the gasification process. It is not believed that changes in coal specifications would appreciably reduce the presence or concentrations of these constituents in the grey water. Use of a lower sulfur coal might reduce sulfate levels in the grey water but no other constituents would be affected. Moreover, one of the primary benefits of the coal gasification technology is to allow the use of higher sulfur coals prevalent in the Midwestern United States since sulfur is very effectively removed from raw syngas prior to combustion in the combustion turbines.

2. Please identify non-point source controls in place and proposed (i.e. spill containment, drainage collection, etc). Many of these should be in the SWPPP and should be included in the anti-deg demo to address the non-point sources of wastewater.

   Response:

   During operation of the IGCC Station, non-point sources of wastewater drainage, seepage and runoff will be primarily storm water that comes in contact with industrial activity. Many control measures will carry over from the Rule 5 Storm Water Pollution Prevention Plan (SWP3) for construction and others will be incorporated after construction is completed. The specific control measures for storm water discharge exposed to industrial activity will be presented in the industrial stormwater SWP3 that will be prepared for the IGCC station in accordance with the pending NPDES permit.

The majority of tanks, drums, and containers for fuel, chemical additives and other potential pollutant sources associated with IGCC Station operation either will be located inside buildings, within secondary containment dikes, curbing, or containment pallets, or will be double-walled such that the potential will be minimized for any release of pollutant sources to come in contact with storm water. Also, spill containment and cleanup supplies will be located at strategic locations in the operations area in the event of a spill or accident requiring these materials. The Spill Prevention Control and Countermeasure Plan (SPCC) contains details for these control systems.

The facility drainage system has been engineered so that most storm water runoff exposed to industrial activity is controlled and diverted into retention ponds where the water is contained prior to being pumped to the final settling basins for discharge via NPDES permitted Outfall 002. Storm water runoff in the central and eastern parts of the operations area will be collected by a series of rock-lined channels and diversions and routed to the Southeast retention pond. Storm water runoff from the area in and around the coal pile will be collected in the Coal Pile Runoff Pond and transported via pipeline directly to the final settling basins. The only exception to this control practice in the central and eastern parts of the project is a 7-acre area on the northeast side of the industrial operations area; this area drains off site through an unnamed tributary to the White River.

A fuel or chemical spill entering the drainage system to the Southeast retention pond can be controlled by containment in the pond and, if necessary, routed to the off-spec pond for capture/treatment of any pollutants prior to release.

Storm water runoff from the western part of the industrial operations area will be collected and routed via rock-lined channels and diversions to the main drainageway through the project area. The drainageway is the main conveyance for storm water runoff from the west side of the operations area and an agricultural area further to the west that drains into the project area.

By the completion of construction, berms, embankments, roadsides and other open areas where there are no project facilities will have been seeded and mulched. Any open areas that have not been stabilized with vegetation when construction is complete and operation starts will be seeded and mulched at that time.

3. Provide more explanation about the overall benefits of using a coal gasification system instead of the traditional coal fired power plant. This will address possible environmental offsets the new plant configuration will create.

Response:

Some additional discussion of the overall benefits of a coal gasification system have been added to the Antidegradation Demonstration.

4. Provide a better description of the cyanide destruction process in terms of cost, technical feasibility, and cyanide removal in section 4.3.3

Response:

The cyanide treatment process will be applied to effluent from the reverse osmosis (RO) unit at the end of the grey water treatment system. Cyanide treatment (or destruction) will be accomplished by alkaline chlorination, a chemical process that oxidizes cyanide to produce sodium bicarbonate and nitrogen through the following two steps:

Stage #1: $HCN + NaOH \rightarrow NaCN + H2O$
$NaCN + NaOCl \rightarrow NaCNO + NaCl$ (pH = 11 S.U.)

Stage #2: $2NaCNO + 3NaOCl + H2O \rightarrow N2 + 3NaCl + 2NaHCO3$ (pH = 8-9 S.U.)

The final step is de-chlorination of the effluent using 38% sodium bisulfite.

The alkaline chlorination process utilizes sodium hydroxide, sulfuric acid, and sodium hypochlorite and the following equipment:

| |
|---|
| Primary Reaction Tank |
| Primary Reaction Tank Agitator |
| Cyanide Destruction Vent Scrubber |
| Cyanide Destruction Vent Fan |
| Cyanide Destruction Vent Scrubber Heater |
| Secondary Reaction Tank |
| Secondary Reaction Tank Agitator |
| Final Reaction Tank |
| Final Reaction Tank Agitator |
| Cyanide System Product Pumps |
| Seal Water Pumps |
| Caustic Pumps |
| Sodium Hypochlorite Tank |
| Primary Sodium Hypochlorite Pumps |
| Secondary Sodium Hypochlorite Pumps |
| Sulfuric Acid Pumps |
| Sodium Bisulfite Pumps |

The alkaline chlorination process is projected to achieve cyanide destruction efficiencies in the range of 94.6% and the overall removal percentage for cyanide through the entire grey water treatment system is projected to be approximately 99.6%. Capital cost ($3.5 million) and annual O&M costs (roughly $350,000) are included in the overall costs projected for the grey water treatment system.

5. Please further describe the grey water recycling system and anything Duke will be doing to reduce the impacts from the discharge of grey water. In section 4.3.3, identify the alternatives that were evaluated and the potential problems/benefits for each.

Response:

A more detailed description of the grey water treatment system was provided IDEM in March 2010 under claim of confidentiality based on the inclusion of trade secret information of the designer and developer of the treatment system. Because of the proprietary trade secret information, Duke is unable to provide a more detailed description of the grey water treatment system in Section 4.3.3 of the Demonstration. Cross references have been added to Section 4.3.3 to the discussion of Option 1 and Option 3 of Section 4.4 to show that Option 1, relating to the underground injection of grey water, was the initial planned approach for its disposition but was dropped after the technical and economic infeasibility of that approach became apparent. The cross references also show that Option 3, dealing with physical/chemical/biological methods of treatment of the grey water, was considered before the selected treatment methodology was identified. The Option 3 approach was ultimately discarded in favor of the selected approach due to substantially lower capital costs for approximately equivalent performance and more reliable operation. The selected treatment approach still carries immense costs – capital cost of the system is projected at $125 million. As pointed out in the discussion in Section 4.3.3, Duke has taken all measures within reason with its selected methods of handling grey water blowdown to minimize any impacts upon the receiving waters with the discharge of the treated grey water. First, a highly sophisticated and effective treatment of the grey water blowdown is being provided. Second, the reject water from the RO (reverse osmosis) step occurring near the end of the grey water treatment process will be routed back to the beginning of the overall grey water treatment process. This avoids the possible need for off-site disposal of this wastestream. Third, Duke plans to reuse the treated grey water as make-up water to the recirculating cooling water systems for the gasification process to reduce the withdrawal rate from the IGCC Station's collector wells.

6. Please further describe the deep well injection 'hazardous' problems in section 4.4. such that a layperson can understand what is being said. As it is stated now, it sounds like Duke can't inject the grey water because the wastewater is considered hazardous, but now Duke plans to discharge it. Explain how Duke made their decision regarding the selected choice for grey water treatment and disposal. Be sure to mention that the grey water will be treated prior to discharge such that it is no longer hazardous.

Response: Revisions have been made to Section 4.4 as requested.

7. Please identify the information sources Duke utilized to state that there are no known mussel beds and/or rare/endangered species in the area of the discharge. Also, if possible, elaborate on potential impacts to the recreational usage of the receiving stream in the vicinity of the discharge (i.e. any outfitters nearby, bait shops, etc.) including a description of existing recreational activities taking place in the river.

Response:

Duke Energy is not aware of any informational resource indicating affirmatively that there are mussel beds or threatened or endangered aquatic species in the Edwardsport vicinity. There is virtually no likelihood of adverse impacts to recreational use of the receiving stream in the vicinity of the discharge from the Edwardsport Station. As stated in the Antidegradation Demonstration, the quality of the discharge from the IGCC Station is projected to be very good and certainly compliant with state water quality-based requirements. Recreational fishing in the West Fork of White River in the Station's vicinity is occurring at rather low levels, based on observations by Duke Energy employees. During a typical day of Duke fisheries work on the river, a very low number of people have been observed fishing on or from the river in the plant's vicinity. There are approximately 11 bait shops within an hour's drive of Edwardsport (none is closer than 15 miles) although most are considerably closer to one of several designated state fishing areas than to Edwardsport.

# Appendix C

EPA No Objection Letter

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

IDEM
OFFICE OF
WATER QUALITY

AUG 16 2010

2010 AUG 19 P 12:06

REPLY TO THE ATTENTION OF:
WN-16J

Bruno Pigott, Assistant Commissioner
Office of Water Quality
Indiana Department of Environmental Management
100 North Senate Avenue
Indianapolis, Indiana 46204

Re: Duke Energy Indiana- Edwardsport
NPDES Permit No. IN0002780

Dear Mr. Pigott:

The U.S. Environmental Protection Agency has reviewed the draft permit and fact sheet for the Duke Energy Indiana- Edwardsport facility. The draft permit has been discussed with your staff and we will not object to issuance of the permit as drafted.

Indiana DEM must resubmit the draft permit to EPA for review if:

a. Prior to the actual date of issuance, an effluent guideline or standard is promulgated which is applicable to the permit and would require revision or modification of a limitation or condition found in the draft permit.

b. A variance is granted and permit conditions are modified to incorporate the variance.

c. There are additional revisions to be incorporated into the final permit which have not been reviewed by this Agency.

When the final permit is issued, please forward one copy and any significant comments received during the public comment period to this office at the above address, attention NPDES Programs Branch.

Sincerely,

Kevin M. Pierard, Chief
NPDES Programs Branch

cc: Steve Roush, IDEM

**INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT**
**PUBLIC NOTICE OF**
**PUBLIC HEARING AND DRAFT NPDES PERMIT**

**PUBLIC NOTICE NO. 2010 – 8F – PH/RD** **DATE OF NOTICE: August 26, 2010**
**HEARING DATE: September 29, 2010** **RESPONSE DATE: October 5, 2010**

**Permit Information: INDUSTRIAL RENEWAL**

**Duke Energy Indiana, Inc. – Edwardsport Generating Station,** Permit No. IN0002780, KNOX COUNTY, 15400 Villwock Rd, Edwardsport, IN. This is the public notice of the Duke Energy Indiana, Inc. – Edwardsport Generating Station Facility draft permit. This industrial facility is a steam electric generating facility. The draft renewal permit addresses the discharge from the existing Legacy Station and the newly proposed Integrated Gasification Combine Cycle Station in Edwardsport, Indiana.

The Duke Energy Indiana, Inc. – Edwardsport Generating Station discharges to the West Fork of the White River consists of process, non-process, sanitary, and storm waters. A complete listing and description of outfalls and discharge points are detailed in the draft Permit and Fact Sheet.

**Tentative Determination:** On the basis of preliminary staff review and application of pertinent standards and regulations, IDEM proposes to issue the Renewal permit which imposes certain effluent limitations, monitoring requirements, and special conditions. The permit term is no more than five years.

**Hearing Information:** IDEM has scheduled a Public Hearing concerning this Draft permit for **Wednesday September 29, 2010, at 6:00 p.m. (local time), at the North Knox High School Auditorium, located at 11110 N. SR. 159, Bicknell, IN 47512.** The purpose of the Hearing is to allow public participation in the determination of the terms and conditions of the NPDES permit. Interested parties should submit written or oral comments to the IDEM representatives at the time of the Hearing.

**Comment Period & Procedures for the Formulation of Final Determination**
The proposed determination to issue an NPDES permit is tentative. Comments not submitted at the Public Hearing must be received/postmarked at IDEM no later than **October 5, 2010** to be considered in the formulation of the Final Determination. Anyone wishing notification of the Final Determination on this permit must provide written contact information to IDEM staff at the Public Hearing or during the specified comment period. Notice of Final Permit action will not be made to persons who fail to comment on the Draft Permit or fail to request such notice. Deliver or mail all requests or comments to address below:

IDEM - Office of Water Quality / Industrial NPDES Permits Section
Attention: Mr. Richard Hamblin - MC 65-42 IGCN Rm 1255
100 North Senate Avenue - Indianapolis, IN 46204-2251
(317) 232-8696

All email requests or comments should be sent to: rhamblin@idem.in.gov

**Additional Information:** All Draft documents are available for review at the above address, file room #1201, between 9:00 a.m. & 4:00 p.m., M-F, (copies 10¢ per page). A Draft copy is also available at the Knox County Health Dept. and the Southwest Regional Office. Please tell others you think might be interested in this matter.

**Special Considerations**
Individuals requiring reasonable accommodations for this Hearing must contact the IDEM - ADA Coordinator at 100 N Senate Av., Rm 1322N, (317) 233-4200, or via the Indiana Relay Service at 1-800-743-3333, at least 72 hours prior to the meeting.

9-29-10